FOOD MANUFACTURE

Incorporating Food Industries Weekly

A PUBLICATION OF THE LEONARD HILL TECHNICAL GROUP MAY 1, 1959

Buttabelle

Here presented in full colour is the fair dairymaid who serves as the trade mark for "Buttabelle"—the perfect butter flavour. Renowned for its purity and true taste, Buttabelle is an invaluable ingredient for use in the making of every kind of confection.

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Flavour stands high in the list of qualities that sell your product. And vanilla is one of the most popular flavourings. That's why Vanillin Monsanto is always in great demand.

Used by food and confectionery manufacturers the world over, Vanillin Monsanto enriches chocolate, confectionery, custard powder, ice cream, biscuits and other foodstuffs.

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K.S SUPER FLITZER

In the U.K. alone there are now over 150 satisfied users of our Super Flitzer and thousands more thoughout the world.

They are all happy with this wonderful machine, which enhances the natural binding power of all meat and ensures no separation of fat, all in a matter of seconds.

Mincers have been eliminated. There is now no need to spend laborious hours de-rinding. The Super Flitzer is a most economical machine. And what a time-saver!

It is simplicity itself to operate, easy to clean and needs only the minimum of maintenance.

Please phone or write for demonstration.

Hilgeland Hints

* No. 1
PORK FAT EMULSION

No more de-rinding! Simply cut off the best fat and put the rest through this machine, with your other pork trimmings. A smooth fresh emulsion will result. Add 5 ozs. of MSB for every 100 lbs.

Up to 20% of this emulsion can replace the same quantity of meat in your normal mix for sausages with better colour and texture and longer keeping qualities.

* No 2.
BEEF FAT EMULSION

Put complete flanks of beef and any trimmings through this machine and for every 100 lbs. add 5 ozs. of MSB.

The homogenised emulsion obtained can be added to an equal quantity of meat and will give beef sausages bloom, binding power and flavour.

* No. 3
LUNCHEON, SAVELOY POLONY, ETC.

No more mincing! Simply put your usual meat and fat, including rinds, etc., through this machine. Add 30% water and 5 ozs. of MSB to every 100 lbs. Mix with normal ingredients.

This mixture will give the finished product binding power, more flavour and a natural meaty texture.

* No. 4
FRANKFURTERS AND MORTADELLA, ETC.

40 lbs. lean beef, pork or veal
30 lbs. pork fat emulsion (see No. 1)
24 lbs. water
6 lbs. Special Foodtech Primamix
5 ozs. MSB

Mix all ingredients and run twice through the machine. This homogenised mixture can then be filled in the normal manner and a top quality product is assured.

Also used for Chicken, Fish, Vegetables and Fruit

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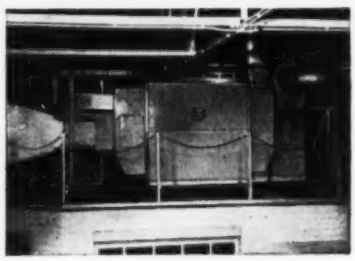
creating the right atmosphere No 1

wrapping boiled sweets

There are no stoppages for cleaning down clogged wrapping machines at the State Confectionery works near Manchester where Hall Brothers have installed a Birlec direct dehumidifier. Completely automatic in operation, the unit can remove 54 lb. of moisture per hour from the air circulated in a 40,000 cu. ft. room housing 50 wrapping machines with their operators. At a working temperature of 70°F, the unit maintains the humidity consistently at 40° RH thus preventing the sweets from becoming sticky and ensuring uninterrupted production with reduced maintenance.



Illustrated above: The boiled sweet wrapping room.
Illustrated below: Birlec CHR direct dehumidifier delivering dry air to the wrapping room.

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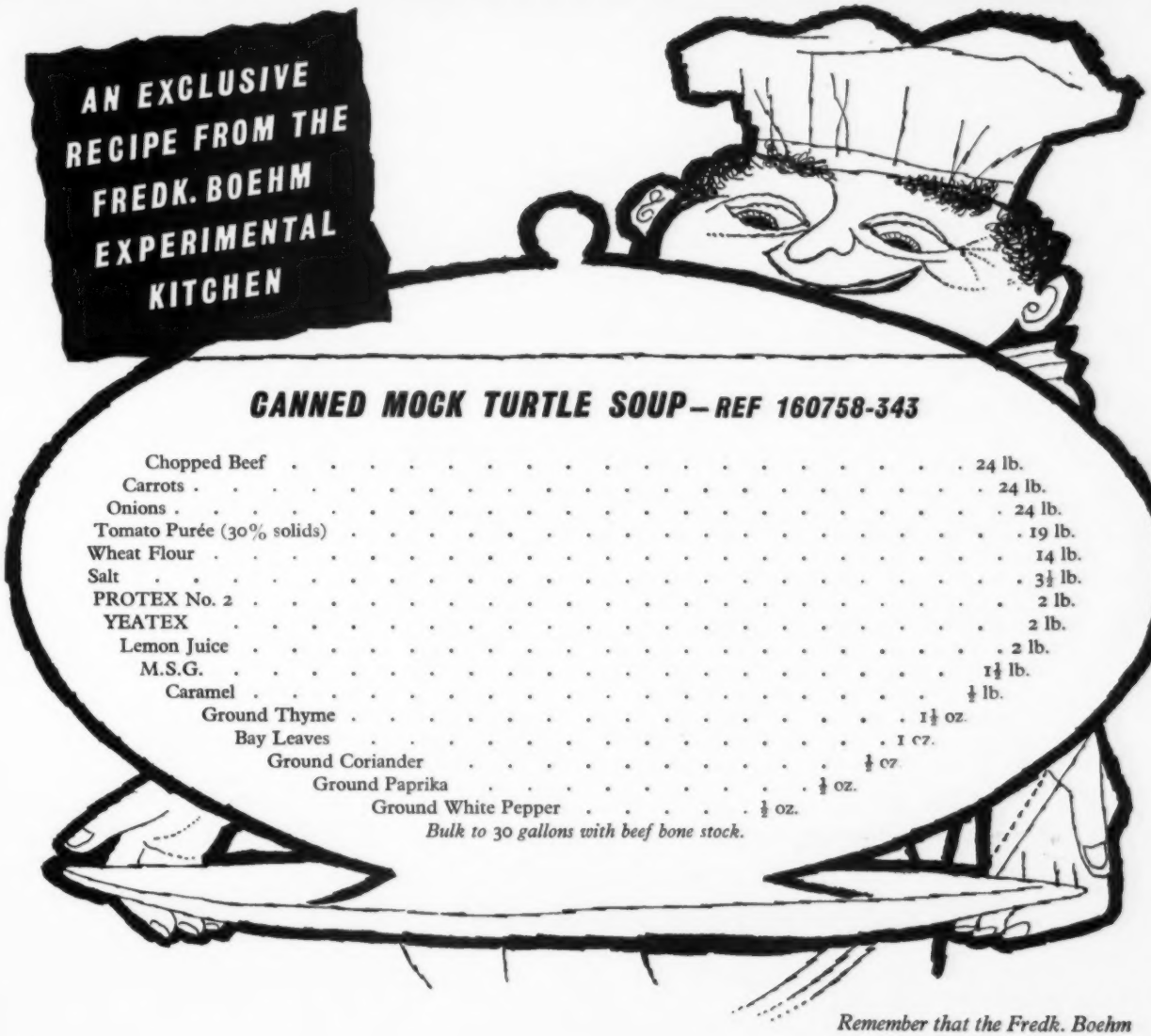

CANNED MOCK TURTLE SOUP—REF 160758-343

Chopped Beef	24 lb.
Carrots	24 lb.
Onions	24 lb.
Tomato Purée (30% solids)	19 lb.
Wheat Flour	14 lb.
Salt	3½ lb.
PROTEX No. 2	2 lb.
YEATEX	2 lb.
Lemon Juice	2 lb.
M.S.G.	1½ lb.
Caramel	½ lb.
Ground Thyme	1½ oz.
Bay Leaves	1 oz.
Ground Coriander	½ oz.
Ground Paprika	½ oz.
Ground White Pepper	½ oz.

Bulk to 30 gallons with beef bone stock.

Boil beef bones in water for two hours to prepare a beef bone stock. Strain and remove fat from stock before use. Prepare and chop the vegetables and cook in water with the bay leaves until tender. Remove the bay leaves and sieve the vegetables to form a purée. Mix the rest of the ingredients with stock to form a smooth paste. Add the chopped beef and the vegetable purée and bulk to 30 gallons with stock. Boil the soup, simmer for five minutes, then fill hot into plain No. 1 Tall cans. Seal and process for 1¼ hours at 240°F., then water cool.

Remember that the Fredk. Boehm Experimental Kitchen exists to help you. Perhaps you have a recipe of your own which is proving to be a problem; or perhaps you want a recipe prepared for you by experts. That is where our unrivalled experience can help you. Write to us at the address below. The service by the way is FREE.

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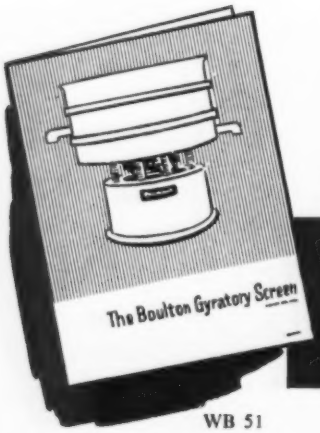

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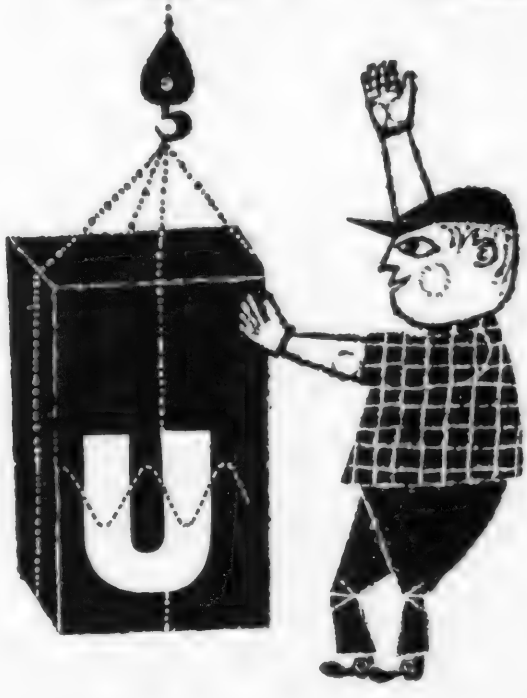

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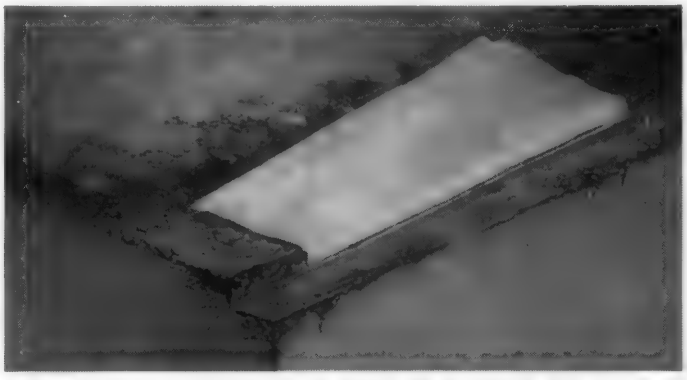
AN ANNOUNCEMENT OF VITAL IMPORTANCE TO EVERY READER OF "Food Manufacture"

Now you can fulfil two objectives when decorating. Readers of this publication are probably familiar with the problems of fungi and mould growth on walls, ceilings and other painted surfaces. We know that in some trades it has become the accepted practice to decorate continually and clean in an attempt to control this serious menace.



PROOF! Photograph of a ceiling partly painted with Fungi-Chek. Test shows heavy mould growth, but the Fungi-Chek is completely free of growth.

Fungi-Chek (Gloss, Matt & Emulsion) Paints serve two purposes:

(1) they provide a decorative finish par excellence, with first class durability and resistance to steam, abrasion, acids and alkalis, etc.

(2) they are made continuously fungicidal and bactericidal, throughout the entire life of the paint film, by the Dentolite Process, and inhibit the growth of Mould, Fungi, Wild Yeasts and Bacteria — pathogenic or otherwise. (Tests after 5 years show the materials to be still thoroughly effective).
Fungi-Chek is entirely free from any toxic compounds of lead, arsenic, copper, mercury, tin or any harmful or poisonous chemicals, i.e. Fungi-Chek is non-poisonous and harmless.

A Technical Advisory Panel is at your service and Scientific Literature and Samples are available on request.

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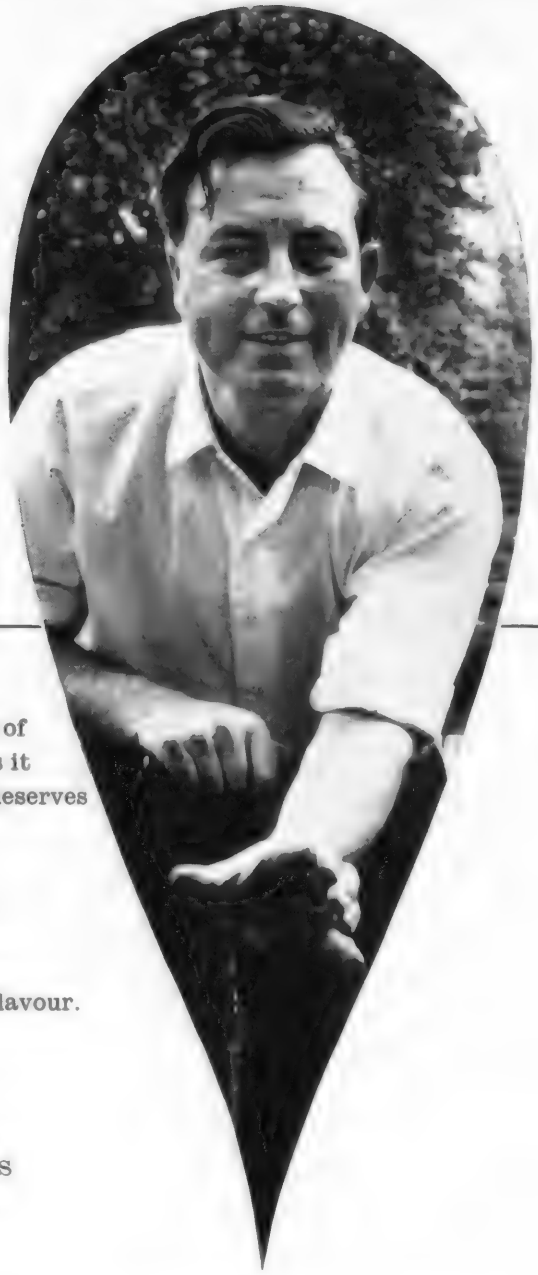
SINCE 1789

DENTON EDWARDS PAINTS LTD.,
ABBEY ROAD, BARKING, ESSEX
RIPpleway 3871 (10 lines)

"Phew-w"



Thirsty work!—but the thought of that sparkling cool drink makes it well worth while. He likes and deserves the best. Insists on it too. That's why so many leading manufacturers of carbonated soft drinks always incorporate Sturge pure citric acid in their products for added piquancy of flavour. Good reputations are enhanced by Sturge—makers of fine chemicals since 1823.

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First name in CITRIC ACID

Citric acid for jams and preserves, fruit squashes and carbonated drinks, ice cream, confectionery, processed cheeses and other food products.

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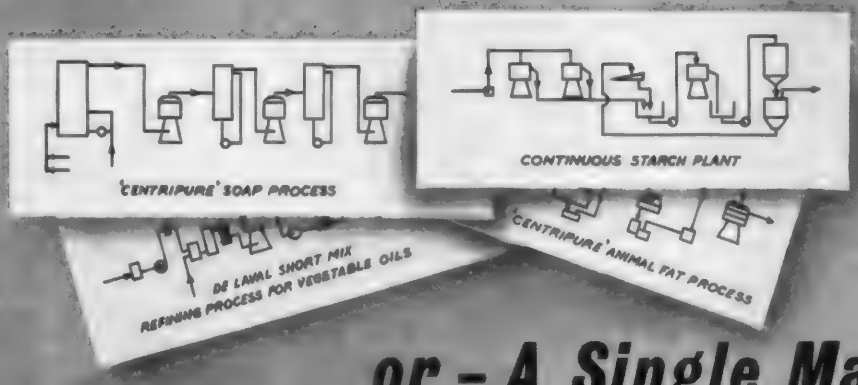

or – A Single Machine

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De Laval offer the most comprehensive range of centrifugal separators for continuous

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Get your separation problem on a continuous automatic system and save manpower, space and money by installing De Laval centrifugal separators.

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The HOLLYMATIC way

See it and you'll believe it! Up to 2,100 patties or Hamburgers an hour, exactly the size and shape you want, can be produced by the amazing new Hollymatic.

Gives ABSOLUTE PORTION CONTROL — each portion the size you decide on, so essential in controlling costs!

Produces MORE PATTIES per pound of meat — with more succulent texture, less shrinkage and faster cooking!

SAVES TIME AND LABOUR — by moulding patties in a great variety of materials and stacking them automatically on paper.

* **Only Hollymatic gives Automatic Paper Feeding.**

The only patty moulding machine that automatically feeds the patty paper under each patty. Eliminates manual work and allows you to use the most advantageous sheet size.

SPECIFICATIONS

PATTY SIZES AND SHAPES
Standard shapes are round or square. Equipment to make odd shapes available at additional cost. A separate hopper bottom is required for each thickness of mould plate used; these may vary from $\frac{1}{8}$" to $\frac{3}{4}$" and can be changed quickly and easily.

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Equipped with a $\frac{1}{3}$ h.p. Capacity type, single phase, 60 cycle motor, in either 110 or 220 volt models. Three phase, direct current, 50 or 25 cycle motors can be supplied at additional cost.

DIMENSIONS
The Hollymatic is 26$\frac{1}{4}$" long x 18$\frac{1}{2}$" wide by 27$\frac{3}{4}$" high.

WEIGHT
The Hollymatic weighs 180 lbs. complete.

Write for details or Telephone

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BY

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The 'Model Fifty' range offers all the advantages of the Benjamin 'Saaflux' system, *plus* improved lampholders, reflector beads and dustproof 'Visor' covers.

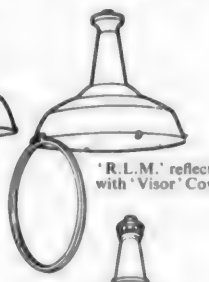
ONLY FIVE 'SAAFLUX' LAMPHOLDER ASSEMBLIES
to cover all needs in the Tungsten range
(others for Fluorescent Bulb and Mercury Lamps)

Only one BC for all reflector types up to 150W.

Only one ES for all reflector types up to 200W.

Only three GES for all reflector types 300W. to 1500W.

Glassteel diffuser



'R.L.M.' reflector with 'Visor' Cover

Stock Bin unit

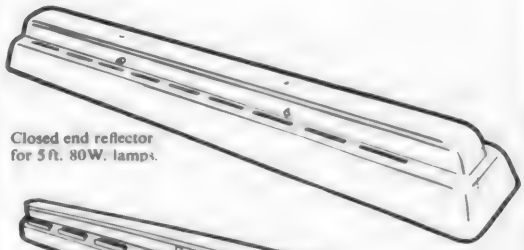
Enclosed Area Floodlight Pole Top.

High Bay reflector

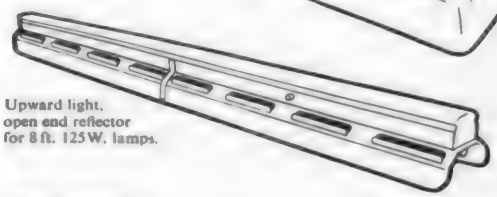
E.D. Dispersive reflector

TASKMASTER 'FLUROLIER' FITTINGS

'Taskmaster'—an outstanding range of contemporary fittings finished in the famous Benjamin 'CRYSTEEL' vitreous enamel. New manufacturing methods bring these improved fittings with **one-piece reflector and one-piece channel** into the competitive price field.



Closed end reflector for 5 ft. 80W. lamps.



Upward light, open end reflector for 8 ft. 125W. lamps.

Open end reflector for 5 ft. 80W. lamps.

Acrylic plastic closed top, closed end reflector for 5 ft. 80W. lamps.

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Research and development by The Steel Company of Wales have helped to make possible this further example of tinplate's increasing versatility. In addition to the special type of tinplate required for canning beer, The Steel Company of Wales produces a wide variety of grades and qualities to suit many specialized applications.

Satisfying more than two-thirds of Britain's needs has taught us a great deal about tinplate. Why not write to us? There are several interesting developments you may not know about.

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THE STEEL COMPANY OF WALES LIMITED

Carmarthen Road, Swansea, Glamorganshire Telephone: Swansea 51571 Telegrams: Welshplate, Swansea

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In short, our Technical Service Department is at your disposal. We invite you to get in touch with us today.

A manufacturer ran into mechanical trouble with a packaging machine using transparent film. He phoned us and we sent an engineer from our Machine Development Section. Soon our photo-unit was slow-motion filming the offending machine in colour. The ciné-film was studied by all concerned, and the faulty action diagnosed. Within days we were helping the makers of the machine to carry out the necessary modifications.

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Progress after 1 week.

Progress after 2 weeks

Photographs by courtesy of T. Wall & Sons (Ice Cream) Ltd.

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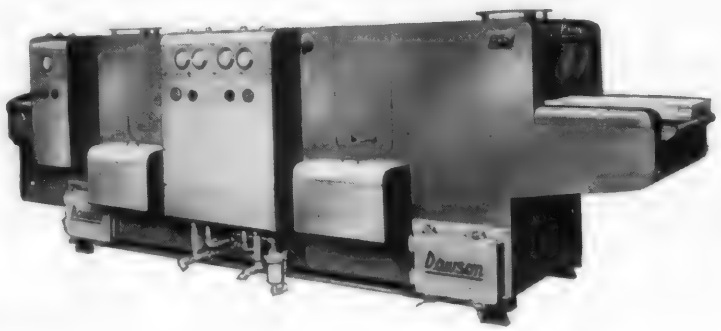
is available for the washing of all types of utensils used by the trade and including Tins, Jars, Bottles, Moulds, etc. Our representative will be pleased to advise you on all your cleaning problems.



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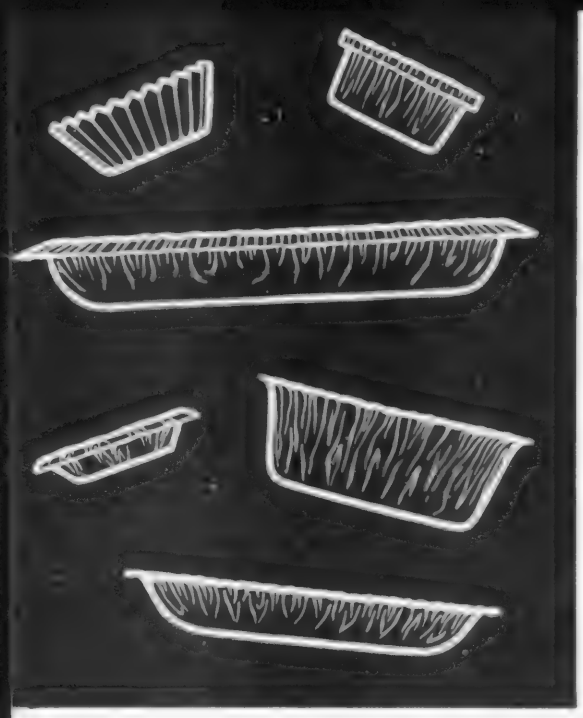

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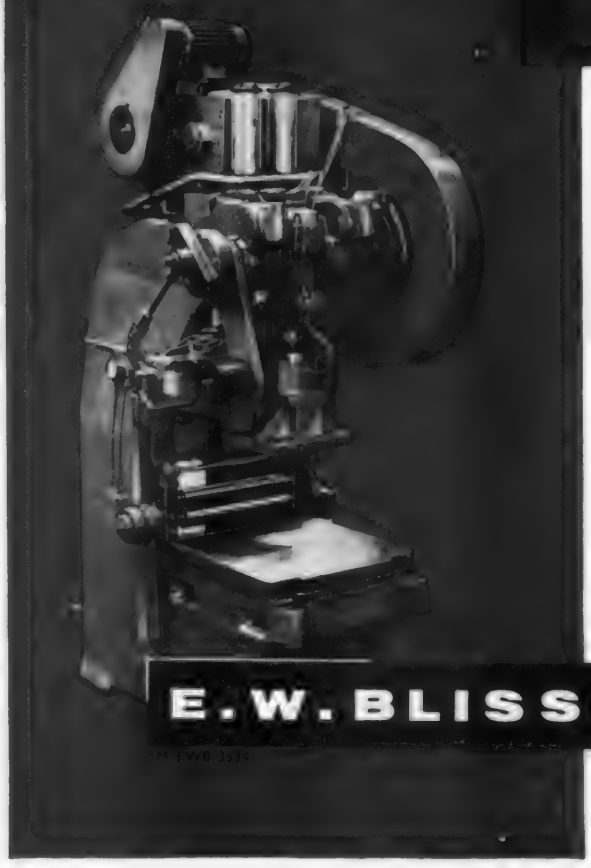

with a BLISS 21½F FOIL PRESS

This press is especially designed for production of pie plates, cake plates and similar aluminium foil products.

Operating at speeds up to 120 strokes per minute this machine is fitted with a precision-type single roll feed mounted between the uprights allowing it to take foil directly from the coil and feed it forward across the die area.

A wide range of both large single die or smaller multiple die work is permissible.

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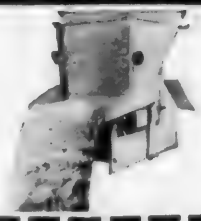
I want feeders that will give both high and low outputs without complicated re-setting.

No problem!

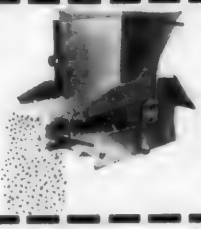
Velofeeder discharge rates can be adjusted in seconds from tons to pounds an hour within a 400-1 ratio.



I want feeders that can be relied on to maintain their output accurately.

Certainly!

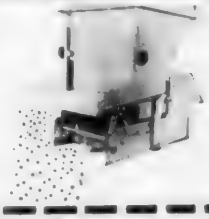
When set to a precise flow, Velofeeder output is unvarying.



I want feeders that can be reset quickly for repeat runs.

Easy!

Accurate re-setting by handwheel and pointer is a Velofeeder feature.



I want feeders that will handle a diversity of materials.

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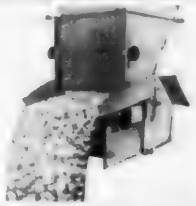
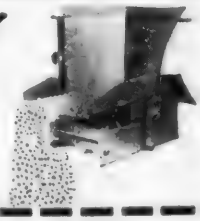
Velofeeders handle smooth or granular products, pulpy or abrasive, fine powders or 2" lumps.



I want feeders that run cheaply and quietly.

Velofeeders do!

Only a ¼ h.p. motor is required and a balanced spring arrangement absorbs vibration and reduces noise.



VELOFEEDERS

give a controlled and sustained feed—on widely varied materials—at tons or pounds an hour.

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F.M.

PLENTY & SON Ltd.

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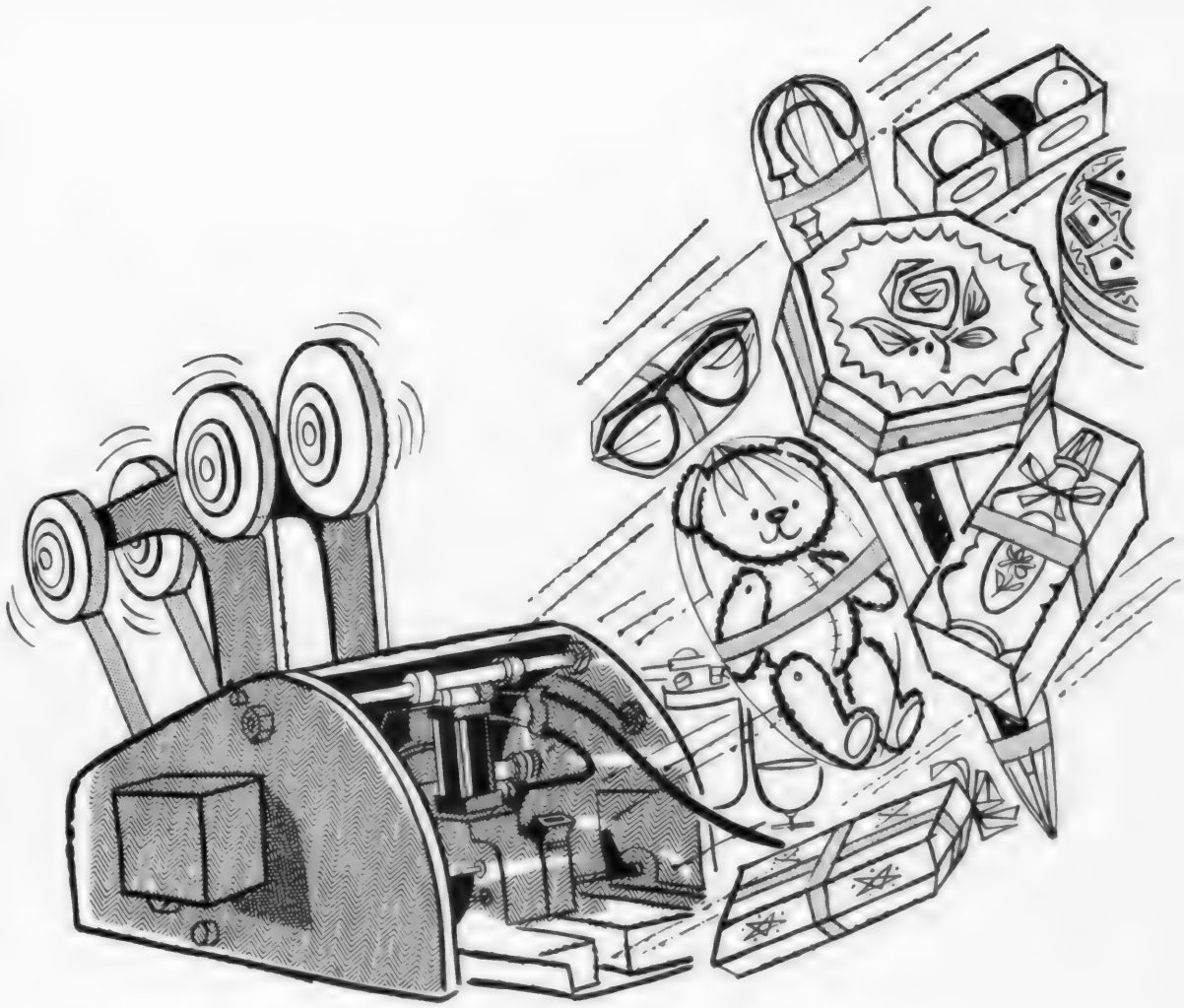

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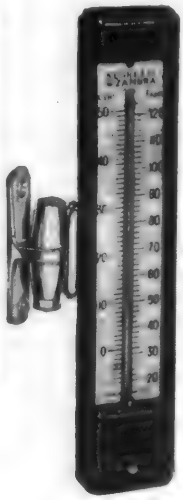
precision-made Thermometers

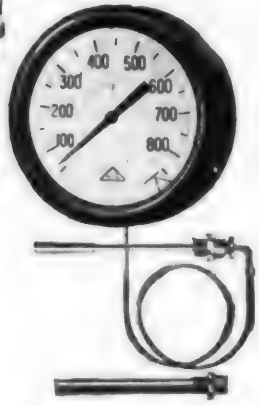
Dipping Thermometer
for hot water, etc.



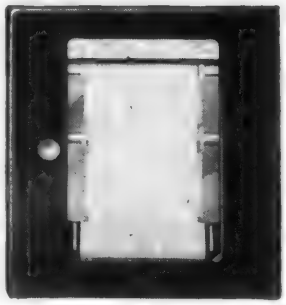
Room Thermometer
with plastic case

Brass-cased Tank and
Pipe Thermometer

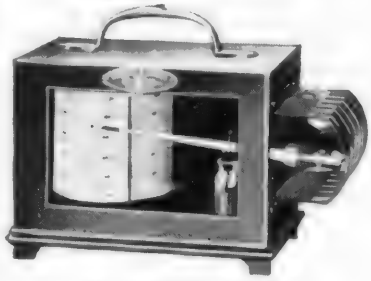
4" Mercury-in-steel
Dial Thermometer,
Rigid Stem Type



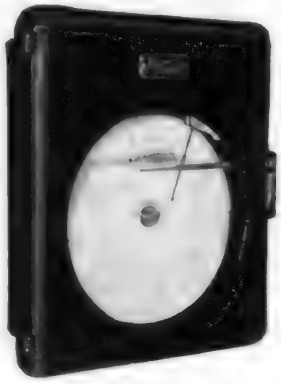
Distance-type Mercury-in-
steel Dial Thermometer



Resistance Thermometer
Recorder



Bi-metallic Recording
Thermometer



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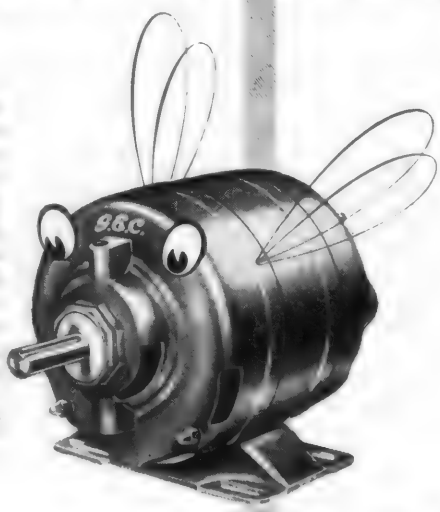

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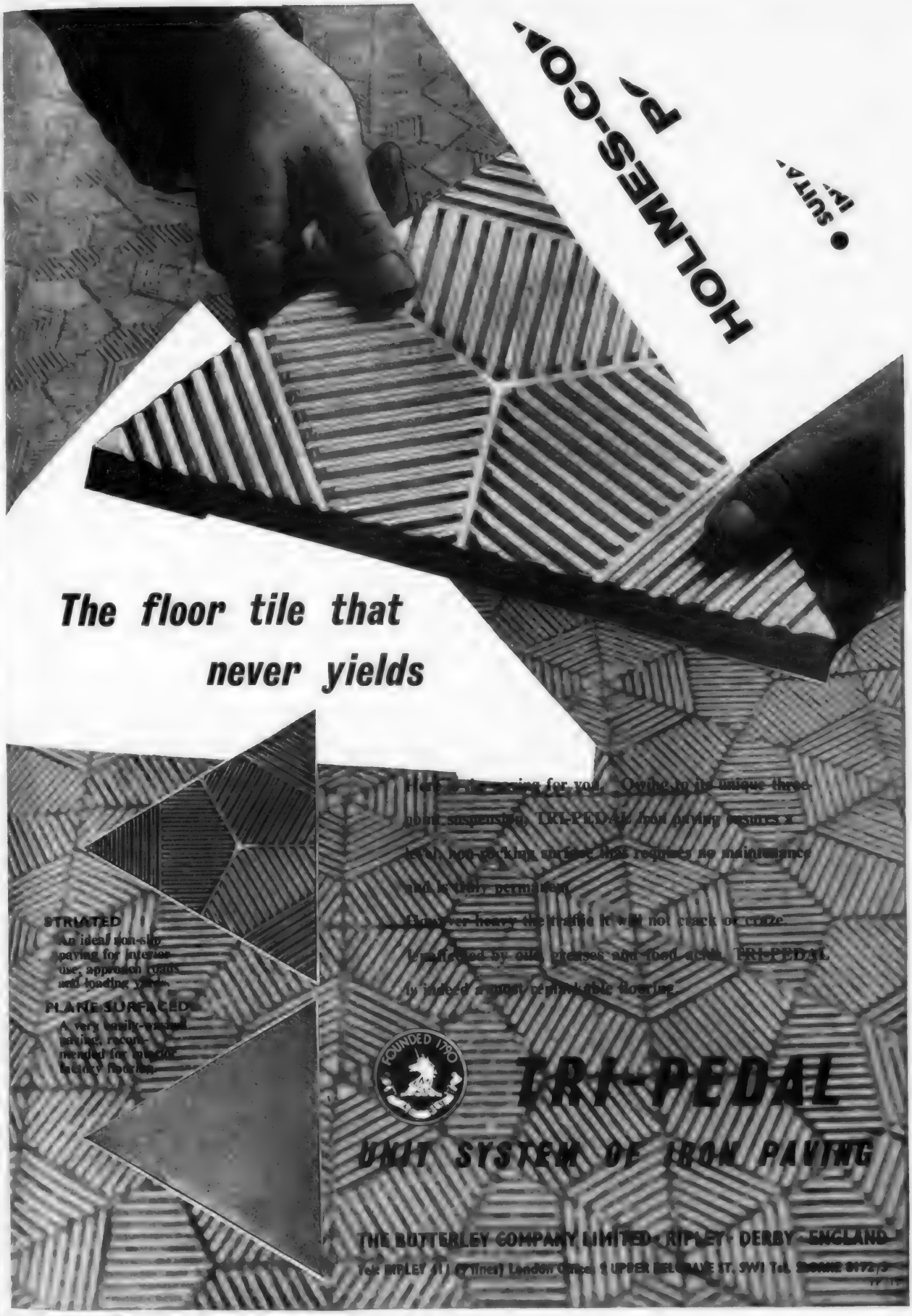
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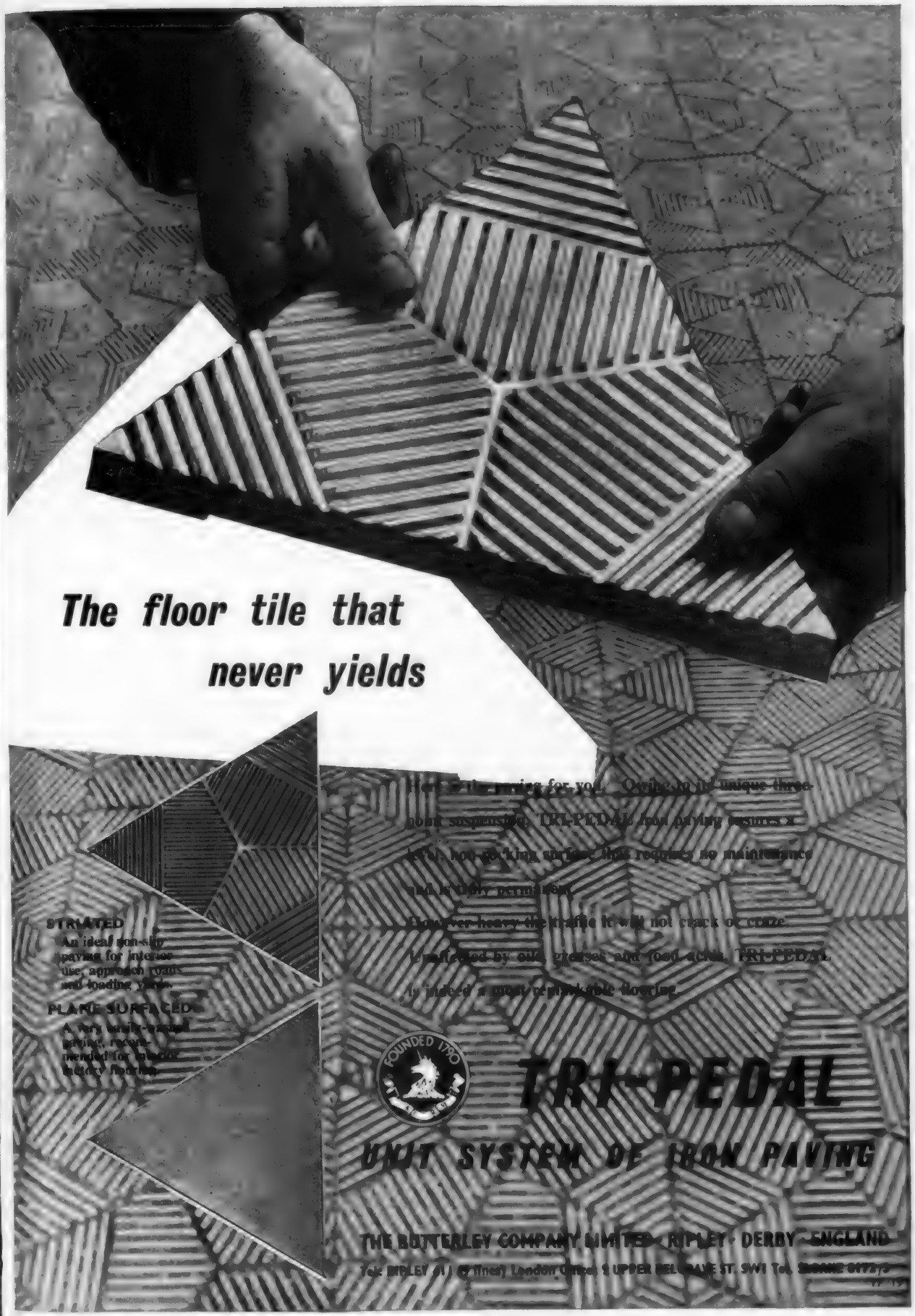
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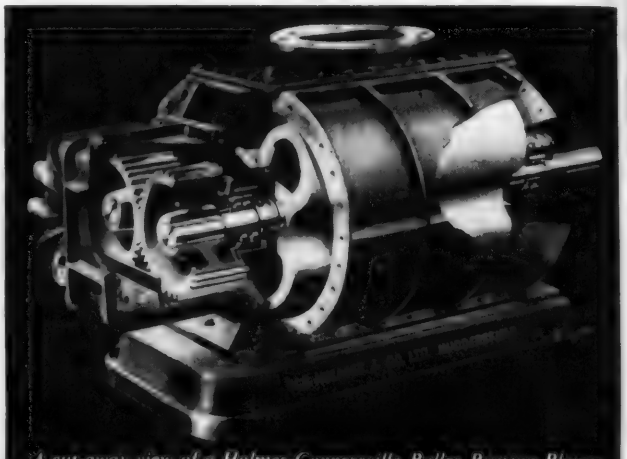

A cut-away view of a Holmes-Connersville Roller Bearing Blower

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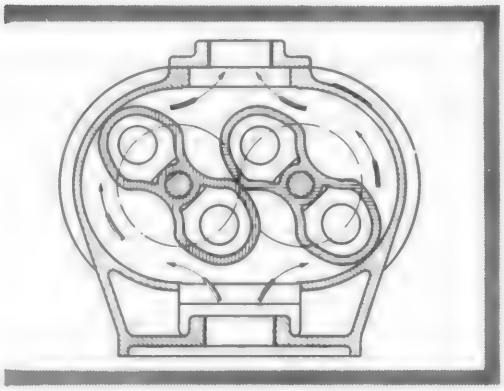

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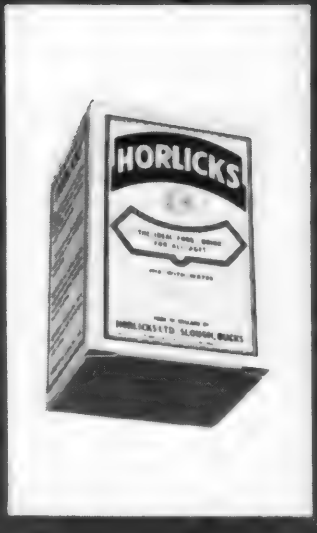

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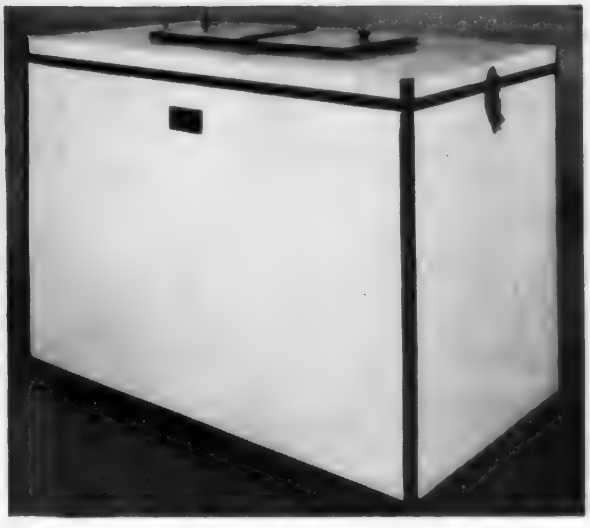

Hold-over cabinets for conserving ice cream faced with 'Darvic' and made by Alexander Battye (Battifreeze) Ltd., Leeds.

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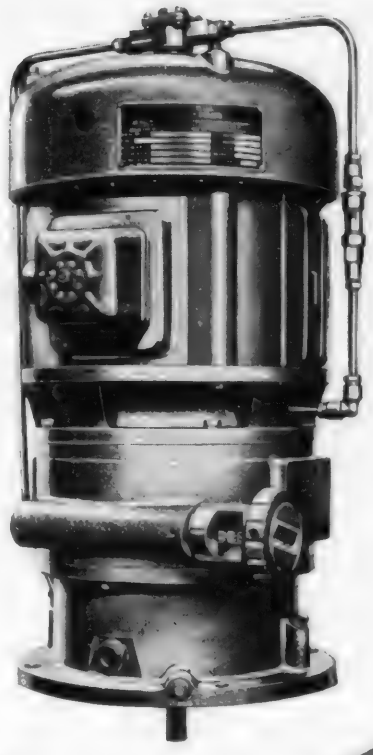

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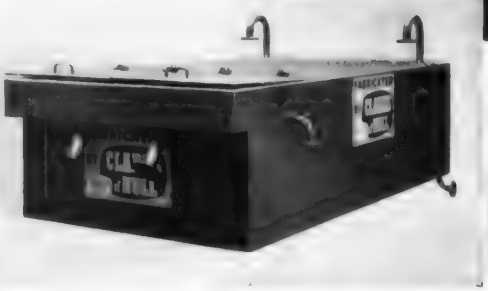

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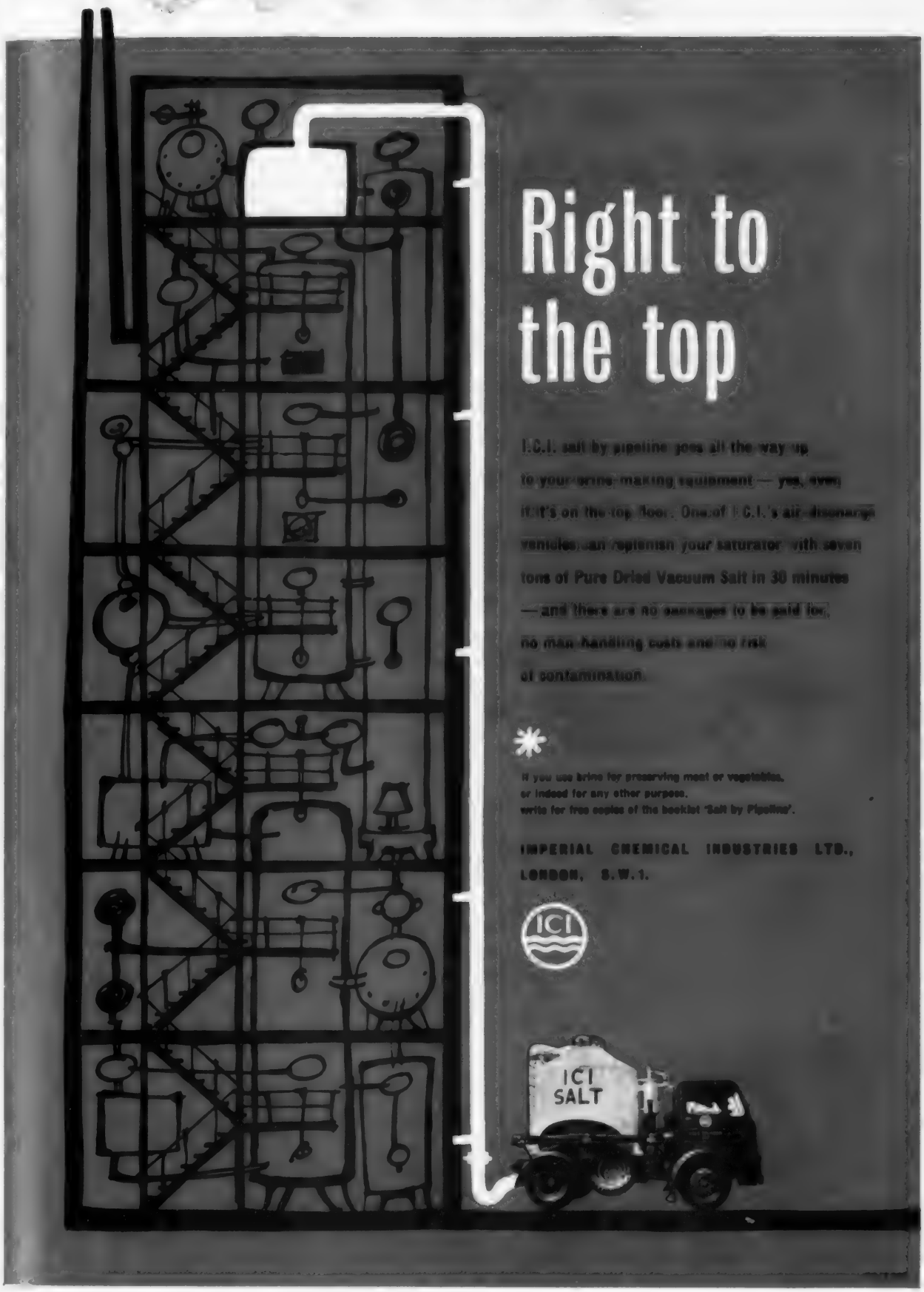
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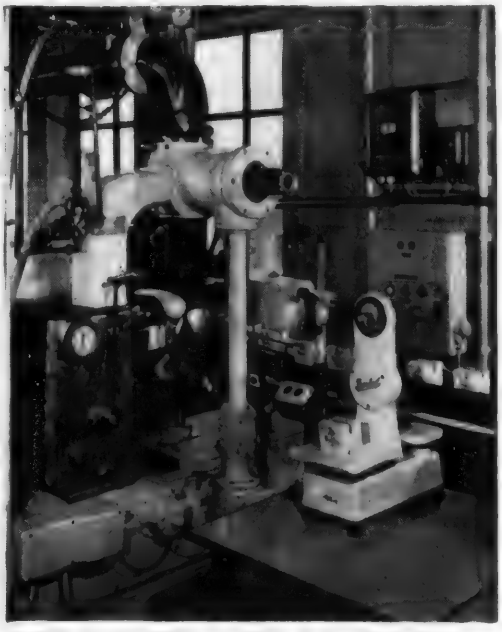

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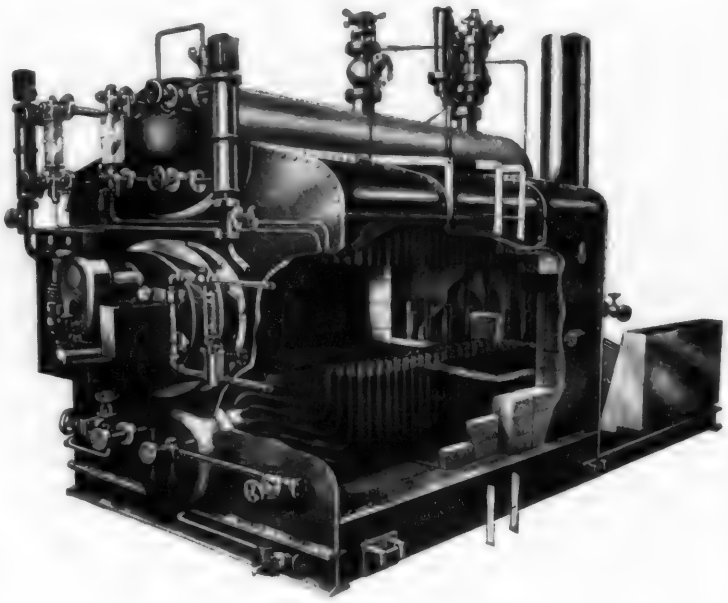

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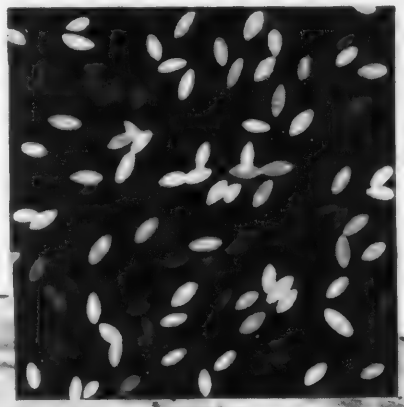

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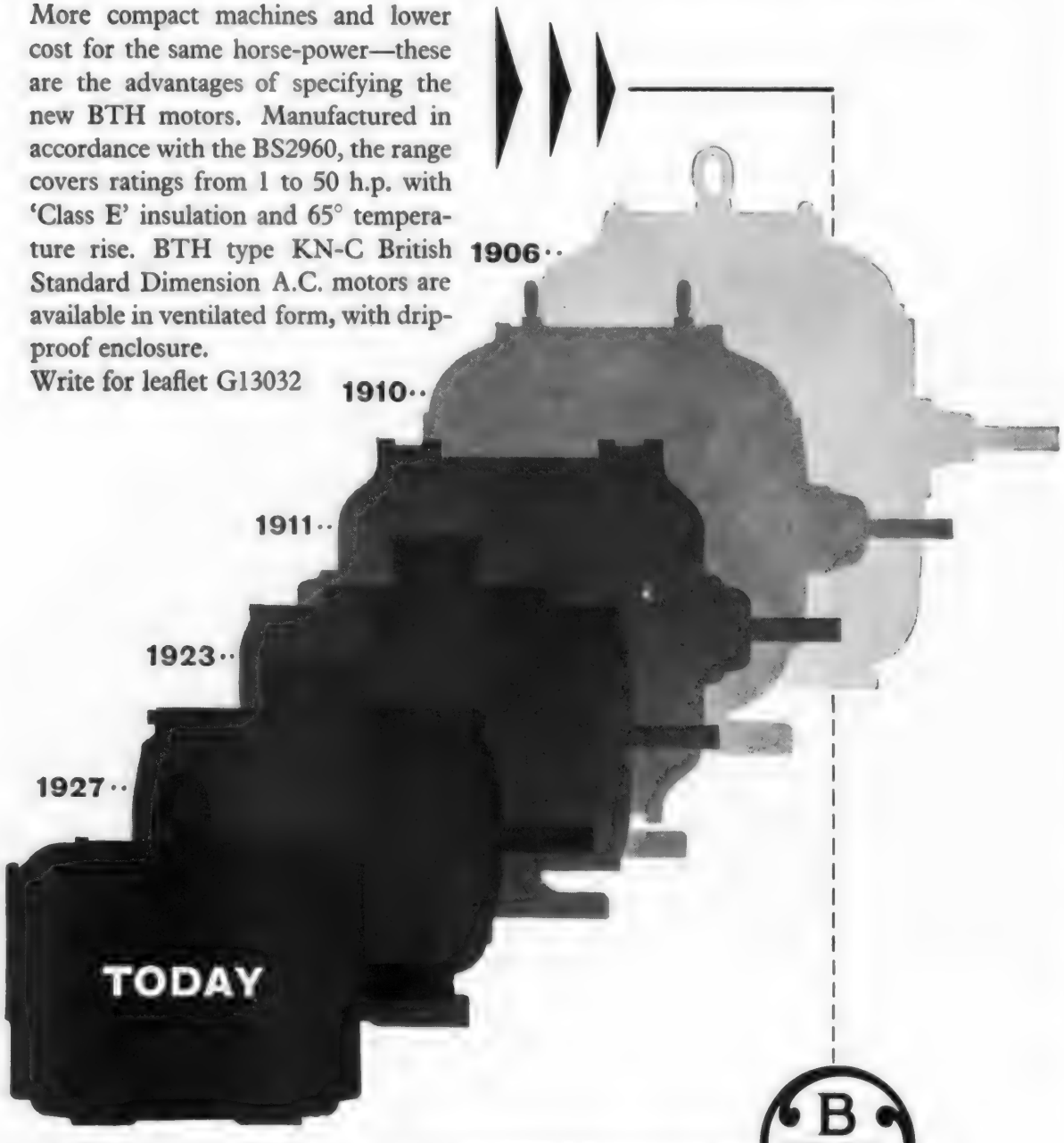

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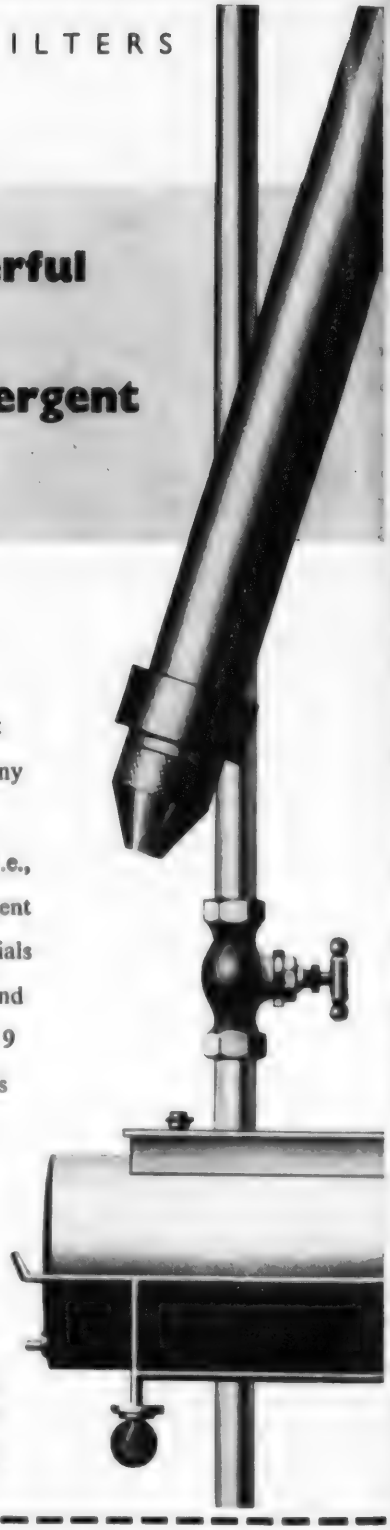

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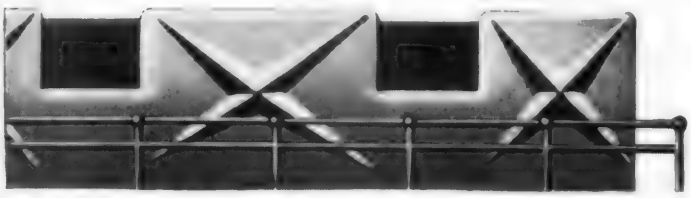

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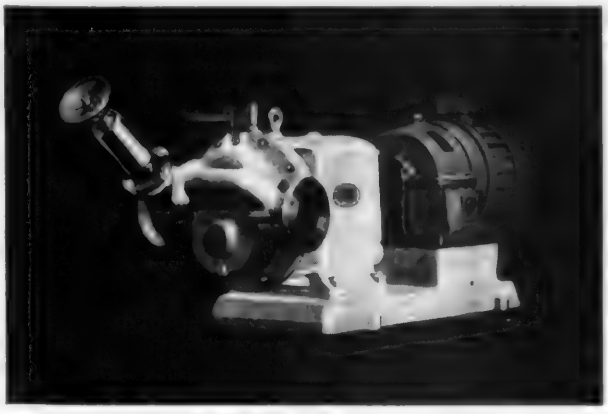

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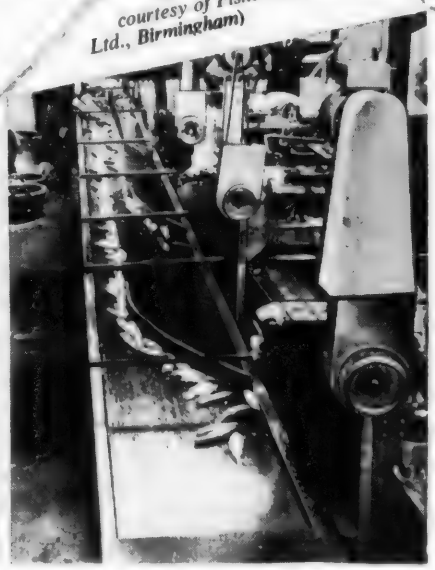
Fruit bottling on a 'Motaveyor' conveyor (by courtesy of J. Mawdsley Ltd., Wigan)



Scandura conveyor in a fish canning factory (by courtesy of Fisher & Ludlow Ltd., Birmingham)

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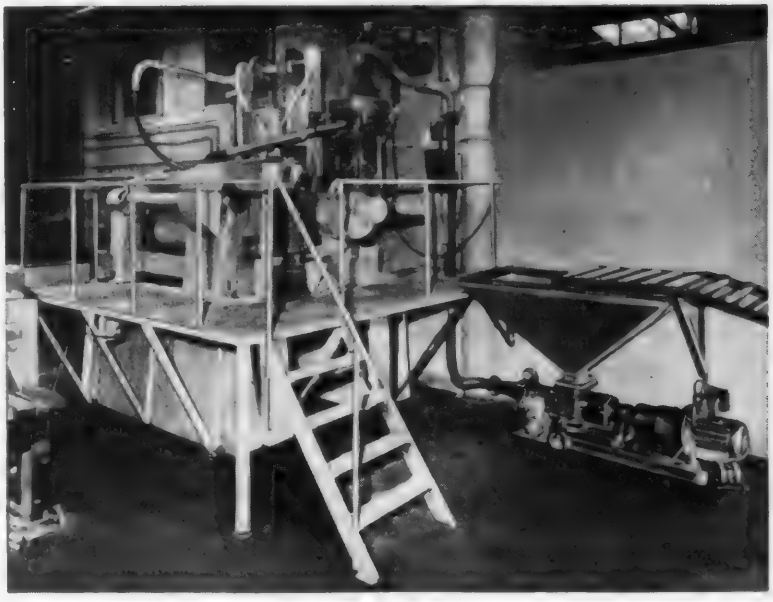

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FOOD MANUFACTURE

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A PUBLICATION OF THE LEONARD HILL TECHNICAL GROUP—ENGLAND: LEONARD HILL HOUSE, EDEN STREET, LONDON, N.W.1, EUSTON 5911. UNITED STATES: 2515, BEVERLY BLVD., LOS ANGELES 57, CALIFORNIA, DUNKIRK 1-2241; 681, MARKET STREET, SAN FRANCISCO 5, CALIF., EXBROOK 2-2612; ROOM 5632, GRAND CENTRAL TERMINAL, NEW YORK 17, N.Y., MURRAY HILL 9-5532; 222, N. WELLS STREET, CHICAGO 6, ILLINOIS, STATE 2-5251; 1900 EUCLID BUILDING, ROOM 225, CLEVELAND 15, OHIO, CHERRY 1-7565; 1214, VILLA DRIVE N.E., ATLANTA, GA., (TRINITY 2-2969). ITALY: VIA FILIPPO TURATI 3, (PALAZZO GIARDINO), MILAN. SWITZERLAND: FORCHSTR. 99, ZURICH 7/32. SWEDEN: TUNNELGATE 19B, STOCKHOLM. FRANCE: 63 AV. KLEBER, PARIS XVI, PASSY 31-30. DENMARK: PEBLINGE DOSSERING 32, ITV, KOBENHAVN N: GERMANY: MR. H. WENZEL, FRANKFURT/MAIN, BÖRNESTRASSE 41.

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Number 9 May 1959

Expelling & Solvent Extraction (No. 2)

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INFORMATION BULLETIN

Copies of this Bulletin, together with a folder, are available on request to Loders & Nucoline Ltd., Unilever House, London, E.C.4.

PRE-TREATMENT

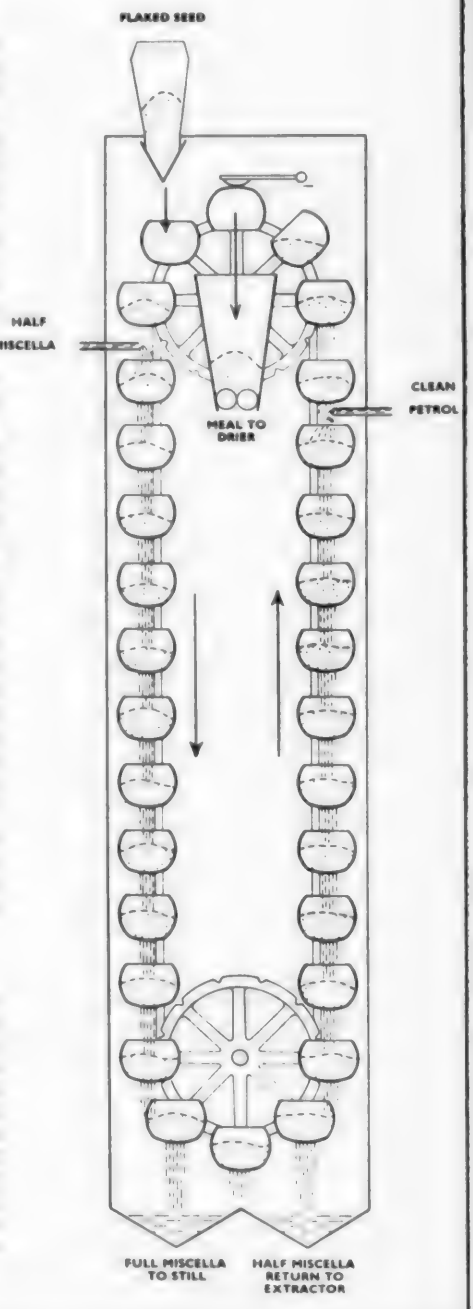
Before the Extraction Process is carried out the seed receives the same pre-treatment described in Information Bulletin No. 8 and afterwards passes through a pair of smooth steel rolls, which have the effect of squashing the seeds into flakes. If the residue from the Low Pressure Expellers is used, then this is conditioned and passed direct to the flaking rolls. Flakes are used rather than meal, which would pack tightly and prevent the free percolation of the solvent.

The principle of solvent extraction is basically a simple one and consists of dissolving the oil from the seed in a suitable solvent, which is distilled off, leaving the oil behind. The solvent in commercial use today is normally Hexane.

SOLVENT EXTRACTION

The continuous extraction plant, illustrated here diagrammatically, consists of a very large vertical bucket elevator. The extractor in normal use has 30 buckets each about 5 ft. long by 2 ft. wide and 2 ft. deep, and each is perforated colander-wise. These buckets are filled automatically with the flaked seed or expeller cake when they reach the top of the downward moving side of the elevator and sprayed with the solvent, plus a portion of oil (the source of this mixture, which is known as miscella, will be apparent later on). This mixture percolates through the seed and drips into the bucket immediately below it and so on. In this way the solvent passes from bucket to bucket, dissolving more and more oil as it drips to the bottom of the extractor vessel. It is now a 15% mixture of oil and solvent and is pumped away to the stills, where the oil is recovered. The buckets on the upward moving side containing partially extracted flakes are washed with pure solvent. This, as before, drips from bucket to bucket and eventually falls into a tank at the bottom and forms the spray which is pumped up to give the washing previously described in the downward-moving side.

After passing the point where the clean petrol has been sprayed on to it, the soaked extracted meal continues on its upward journey until it reaches the top, where the bucket is turned upside down, emptying the contents into a hopper from which they pass to a Drier.



THE BATCH METHOD

Another semi-continuous method of solvent extraction is in use. Known as the Batch method, the plant consists of a series of tanks or pots usually linked in groups of five. These pots are charged with the flaked seed and filled with the solvent. To extract the maximum amount of oil and at the same time economise in operations, every new batch of flaked seed is washed for 20 minutes each in five solutions of solvent, the first being highly charged with oil from four previous washings, the next having been used three times previously and so on until the last washing is clean solvent, which in its turn is pumped through to the other pots to repeat the process. The solution of solvent and oil is then separated by distillation.

LN 52-8058

FOOD MANUFACTURE

Vol. XXXIV, No. 5 May 1, 1959

Coffee—instant and otherwise

A SEEMINGLY trivial discovery in 1954 by coffee processors, who learnt how to retain the flavour of natural coffee without using ingredients other than coffee itself, has had a far-reaching effect on the sales of coffee in this country. Whereas before 1955 "instant" or processed coffee accounted regularly for between a quarter and a third of total coffee consumption, since then the consumption of processed coffee has trebled without there being a marked increase in the consumption of natural coffee. The result is that whereas pure coffee is drunk in only 6% of British households, processed coffee is being drunk in 21% and this figure is still climbing. The latter product is invading spheres where formerly coffee was not drunk; the combination of the virtue of being pure coffee with the ease of preparation is undoubtedly the biggest attraction. Initial fears that the growing popularity of processed coffee would affect the sales of the natural product have so far been groundless.

At one time, for those who bothered to take note of such trivialities, coffee on the breakfast table used to be a mark of superior social standing, but the tremendous multiplication of coffee bars has brought coffee to the level of its plebeian and more widely consumed companion, tea. Coffee has had an interesting and rather chequered political and social history. In the seventeenth and eighteenth centuries, coffee houses were centres of business and political activities and meeting places of the devotees of art and literature. Charles II suppressed them as "seminaries of sedition," but soon repented. The vast organisation of Lloyds grew from Lloyd's coffee house. Such establishments were not always popular; it is recorded that objections to one were made on the ground that its proprietor "annoyeth his neighbours by evill smells."

If its social status is lower, the quality of the beverage in this country is certainly higher today than formerly. It used to be said that "London is the place where the world's best coffee is to be bought and the world's worst coffee is to be drunk," but nowadays the second part of this statement surely is not true. Among the coffees of the world, that of Kenya has a high reputation, but it was unappreciated in its own country, for nowhere have we tasted such uniformly bad coffee as in that very country! That was, however, a few years ago, and lest we offend the coffee drinkers of Kenya, we hasten to add that the standard of preparing coffee there has no doubt improved since then.

Incidentally, we hear from the U.S. that liquid instant coffee is the latest product to appear in aerosol containers. Green coffee is purchased, blended, roasted, ground, extracted, packed, and shipped—all in one day. A two-piece extruded seamless can with a valve featuring a nylon dip tube is used together with nitrogen as a propellant. Freshly extracted liquid coffee is pumped from holding tanks to a filler where the product is filled into cans that have been sterilised on an autoclave and unscrambled. The cans are checkweighed after the coffee has been inserted (leaving ample headspace). The valve is then crimped on, vacuum drawn, and the nitrogen added. The containers are then tested in a tank and the caps are applied.

. . . and chicory

CHICORY varieties have been known for many centuries, and according to historians, the Romans regarded the root as a delicacy. It is still used as a green vegetable, especially for salads, but nowadays its chief use is in blending with coffee. It was first used for this purpose during the blockade of Europe by Napoleon, when together with roasted cereals, it was added to coffee to eke out the meagre supplies.

Much of our chicory comes from South Africa, the main producing areas being the Eastern Cape Province, of which the Alexandria, Albany, and Bathurst districts are the most important. During the last few years, output has been running at the rate of about 19 million lb. a year. The Chicory Control Board of South Africa reports that more people are acquiring a preference for chicory-blended coffee. We cannot disagree with the facts adduced by that august body, although we prefer our chicory in salad rather than in coffee. We are not alone in that opinion, for surely do not the increasing sales of pure instant coffee as mentioned in the previous comment betoken an appreciation of the pure stuff?

The belief that certain constituents of chicory are harmful to the heart has apparently been disproved by the investigations of a scientist in New York, who is reported to have said that chicory neutralises the tendency of coffee to cause sleeplessness when taken at bedtime. Another advantage claimed for chicory is that it helps to preserve the rather fugitive flavours and aromas of pure coffee.

Carbohydrates and calories

"WHEN the temperature is low we all need more of certain foods because more 'fuel' is burnt up by the body's efforts to resist cold. The easiest way to increase your calories is to step up your carbohydrates." Perhaps, but is it the wisest way? This quotation from a company house journal illustrates the somewhat loose thinking prevalent among the general public concerning the function of food. Last March we commented on the concern felt by school health authorities about increasing fatness among children, a cause of which seems to be too much sweet eating. During the last twenty-five years or so it has been fashionable to ridicule a simple connection between the amount and kind of food consumed and the problem of excessive weight; extraordinary efforts have been made by all manner of people, from purveyors of patent foods to popular writers, to get round the simple fact that too much food and too little exercise is the cause of much obesity. According to the *British Medical Journal*, there are signs that we are emerging from this period of clamour and confusion.

It seems that the balance of emphasis in food is beginning to shift from calories to fat; intensive propaganda has led the layman to associate calories with carbohydrates, yet fat contains calories, and medical evidence strongly supports the conclusion that high-fat low-carbohydrate diets with unrestricted calorie intake do more to remove unhealthy pounds from the obese than anything else. The chairman of the American Medical Association said at the annual meeting in 1957 that "the simplest to prepare and most easily obtained high-protein, high-fat, low-carbohydrate diet, and the one that will produce the most rapid loss of weight without hunger, weakness, lethargy or constipation, is made up of meat, fat, and water. The total quantity need not be noted."

Insurance companies' statistics show that obesity constitutes a hazard to both health and longevity. Too much weight overloads the heart and causes all manner of undesirable side effects. Not all obesity, of course, has such a simple cause as overeating; yet even those suffering from metabolic disorders may, it seems, derive considerable benefit from a high-fat low carbohydrate diet.

Room at the top

THE market for pre-packed foods for domestic animals, despite the fact that British dogs and cats already consume food worth more than £40 million a year, of which about half is thought to be of the prepared variety, is capable of further expansion. Some people may think that far too much is spent on feeding Fido or Tiddles when it is possible to feed them with scraps or leavings from the table. Manufacturers are confident that they can reduce still further the share of the trade held by the butcher and the fishmonger, whose offal and scraps constitute a large part of the supply, for in the U.S. more than £125 million a year is spent on dog food alone.

The cost of advertising on a large scale is sufficient to deter a number of firms who might otherwise be tempted to try and cut a piece of this succulent cake for themselves. Competition is becoming keener and the resistance of the "unconverted" has to be overcome; accordingly, more schemes are being thought up by the makers. One which caught our eye was the distribution of more than £19,000 in prizes in a "Which cat is the grandmother?" competition, while yet another was an accident insurance scheme to give up to £10 for veterinary treatment of dogs involved in road accidents. Even greater developments may be expected in the bird-food market, for a survey of grocer customers showed that more than 25% of householders keep a cagebird.

The convenience of prepared foods compared with horseflesh and scraps hardly needs to be emphasised, but up to the moment it has not been established that animals live longer on their special foods. Manufacturers will, it is felt, release products which are claimed to be more titivating and nutritious than previously and so the householder will spend more to ensure that their pets have nothing but the best.

Distribution of industry

LAST February in these columns we remarked on the desirability of decentralising industry and moving from the towns into rural areas. In reply to a question in the House of Commons, a list of the areas where Government financial assistance is available on the recommendation of DATAC (Development Areas Treasury Advisory Committee) was given, and an amended list containing some additions has recently been issued. This list will be of interest to those concerns contemplating setting up establishments in these areas.

The purpose of the Government scheme is to deal with the problem of local unemployment in certain areas, and two complementary methods of approach are being used. The first is by means of DATAC loans, under which any firm seeking to move into or

extend in a place of high unemployment and can show that its project will reduce unemployment, may apply for a grant or loan. It has to show that it is a sound concern and that it cannot get the necessary facilities from banks or other sources. A number of firms have already taken advantage of the opportunity and some loans have been recommended.

The second method is by refusing to grant industrial development certificates in certain areas to firms wishing to expand whenever it is considered that they can reasonably go elsewhere. For some years now certificates have been refused under such conditions to firms wishing to expand in the London area, and this policy extends to other parts of the country which are industrially congested and which have little unemployment. This is bound to benefit those areas where unemployment is higher. If it is not allowed to expand in its chosen area, the firm may look for an alternative site and the attraction of a DATAC loan may be the deciding factor.

Areas where Government assistance under the Distribution of Industry (Industrial Finance) Act, 1958, is available include parts of Cornwall, Devon, Durham, Kent, Lancashire, Cheshire, Lincolnshire, Norfolk, Suffolk, and Yorkshire, the Isle of Wight, Rochdale and Oldham.

No snuff in Scotland

As a result of some two years of consideration and many more years of pressure, regulations governing Scottish food preparation and distribution centres came into force on May 1. The regulations, the Food Hygiene (Scotland) Regulations, 1959, are aimed at correcting certain aspects of the food handling situation which disturbed medical and local authorities. The main complaint of the latter was that the existing system had no bite and authorities were unable to take action even in serious cases. The new regulations amend this by making possible prosecutions with fines of up to £500 or one year's imprisonment. At the gathering to mark the launching of the new regulations it was stressed that trade organisations had co-operated completely.

To implement the new regulations the Department of Health for Scotland has issued a booklet which gives, in question and answer form, the main features of the regulations which are intended ultimately to cover factories as well. The main changes are that the responsibility for maintaining complete cleanliness rests on the owner of premises, the tenant, and the employee; each or all may be required to answer for any shortcomings. Structural and toilet facilities are detailed and separate washing units must be provided for food cleaning and personal hygiene. Specific methods of cleaning food utensils are laid down as also are methods of storing food. Refrigerated space is recommended for many of the foods which have been associated with outbreaks of food poisoning. It is hoped that the cases of illness from food poisoning, 1,332 and 1,334 respectively, notified in the past two years, will now show a downward trend.

With regard to personal hygiene, smoking, chewing, and taking of snuff by employees handling food are banned, and notices saying "now wash your hands" must be posted within lavatories.

There are exemptions to the rulings, and it is thought that there are many obvious snags; local authorities may vary in their rulings. Nevertheless, the new regulations are believed to be a much needed step forward in the aim of ensuring that the customer receives food of a pure and wholesome nature.

Addenda ad infinitum

OUR burst into classical idiom is prompted by some reflections on the new food additive law which came into effect in the U.S.A. on March 5 and which enforces in that country the pre-testing of food additives. It is estimated that the number of food additives now in use runs into hundreds, and the preparation of a meal entirely free from them would now, for urban dwellers, be extremely difficult. The march of civilisation and the growth of city populations has made these substances necessary; movement of food over long distances and extended storage means that preservatives must be added, together with mould inhibitors for foods such as bread and cheese. Emulsifiers are needed to prevent separation of the components of salad dressings; flavouring agents, stabilisers and thickeners, buffers and neutralising agents, curers, humectants, driers, colours, not to mention nutrients and enrichers, are only some of the groups of additives universally used in processed food. These substances are beneficial inasmuch as they improve palatability and prevent deterioration, provided of course that stringent safeguards are applied. The Federal Food and Drug Administration has paid tribute to the sense of responsibility shown by American industry in being ahead of the law in many respects and setting its own safety standards for food additives, with the result that no deaths and only a few cases of non-permanent poisoning have occurred in the U.S.A. during the past 20 years, in which time the list of additives has grown enormously.

The whole question now needs a radically different approach from that of 1938, when the original American Act came into force. The problem at that time was to control the use of poisonous and harmful substances and to provide safe tolerances for those

which were unavoidable. Since then, knowledge of the usefulness of certain chemicals in food processing has made tremendous strides; hundreds of chemicals not used in 1938, many being then unknown, have come into use, and thousands have been considered in varying degrees. The problem of testing has got quite beyond the capabilities of the F.D.A. and has made revision of the law a necessity.

In this country the situation is paralleled, and American experience will be watched with interest, not only by those who export to that country and who have, therefore, to concern themselves directly with American legislation, but because our technological set-up is similar and the problems it raises not unlike those on the other side of the Atlantic.

Food quackery

THERE is, however, another side to the question of food additives which is causing concern to the American Medical Association, and that is the misrepresentation of the benefits of food supplements by unscrupulous promoters who make claims far beyond the actual facts. It is the old, old story. Food supplements which serve a useful purpose when for some special reason a person requires an addition to his diet, are paraded before a gullible public as elixirs of life and universal cure-alls. The idea is not unknown over here, but such is the American way of life that it seems the racket is much greater there, and, according to the A.M.A., now costs 10 million Americans more than £160 million a year. Arthur S. Flemming, U.S. Secretary of Health, Education, and Welfare, recently announced a campaign against this "most widespread and expensive form of medical quackery in the country today," and said he would do everything he could to assist the F.D.A. in the enforcement of the law against those who deliberately seek to deceive the people with false medical claims, the results of which "can be tragic."

One of the most effective antidotes to this sort of chicanery is an understanding on the part of the public of the facts of nutrition; this can best be brought about by a vigorous educational programme by the Government and responsible organisations. It is astonishing how a thinly disguised superstition and belief in magic lingers on in the minds of those one least expects, even though those concerned would hotly deny it. Call something by an exotic name or mysterious formulary and charge the earth for it, and purchasers will be found, secure in the conviction (how false and short lived) that here at last is the answer to their particular problem. If this is not superstition, what is? The sooner the man in the street realises that scientists are not magicians, and that quackery is not science, the better.

Mechanical handling

IN days of old, the top men of our race put their less fortunate brethren to work for them in servitude, encouraging them with whips and goads (the practice lingers still in some parts of our planet). The pace of life was slower, human life was cheap, and the economics of a thousand toiling workers, regarded as expendable anyway, labouring for years uncounted to produce the monuments of the past, were not, we should think, worked out with the same precision that today is applied to costing. Nowadays, technology has enabled man to harness powers far greater than that of unaided muscle, human or animal. The problem of shifting things about is now a specialised study in its own right, the fruits of which are seen in the countless ingenious devices now available for handling every variety of object large or small. A managing director we used to know, a remarkable man now no longer with us, used to say that when he was confronted with the problem of moving something, he first tried to think of ways whereby it need not be moved. This is a sound basic principle applicable to many other fields besides the handling of goods, but we need not pursue the argument too far.

The days when every device to speed output and reduce human labour was viewed with suspicion are now practically gone, although occasionally one meets a die-hard of the old school who regards the installation of a machine to do the work of umpteen men as defrauding the labourer of his hire. Even labourers are coming to realise that a firm which persists in using obsolete machinery or none at all will eventually find itself out of business and its labour will be on the dole. In the long run, although the capital cost of new equipment may be high, it pays for itself many times over in reducing production and handling costs, speeding output, and not least, boosting the morale of the staff. Many firms still show a reluctance to replace outworn handling equipment and methods with something up to date. This is a case of spoiling the ship for a ha'porth of tar. One of the most common excuses for clinging to a certain method, surely one of the most illogical, is that "it has always been done that way." This attitude is the antithesis of progress. Perhaps a perusal of pages 205 to 210 in this issue, wherein are reviewed some mechanical handling devices to help the food manufacturer, will help those holding such an outlook to realise that in the latter half of this twentieth century outmoded ideas do not pay.

The range of equipment described includes conveyors of many types, lifting appliances, plant for handling materials in process, storage equipment and motors and drives.

Bovril Factory makes Meat Extract and Soft Drinks

Advanced research methods yield new facts about nutrition

During a recent exclusive visit, FOOD MANUFACTURE was shown how "Bovril" and "Jaffajuce" are made and bottled with the latest automatic machinery, and how the research department is tackling fundamental nutrition problems.

"IT was just one of those things that occurred to one over a cigar," was the reply of the inventor of Bovril, John L. Johnston, when he was asked how he thought of the name. This was at an interview given to a journalist after the closing of the Exhibition of 1887, where Johnston's Fluid Beef had been attracting great attention. Johnston's Fluid Beef was made, naturally, from beef, and the Latin word *bos* had to be used. He had been reading Lord Lytton's novel *The Coming Race*, where members of a future community in the novel had discovered a powerful electric fluid called *Vril*, so there it was—*Bo-Vril*.

John L. Johnston, a young Scottish dietetic expert, had been experimenting with methods of preserving beef products for some time when he secured, in 1871, a contract from the French Government for the supply of preserved beef to help stock their fortresses with food which would last for many years. The available supplies of beef in Britain, however, were not enough to fulfil the requirements of this contract, and in 1873, after surveying world-wide sources of supply, John L. Johnston formed a company to provide the necessary capital, and built a factory in Quebec. While the French contract was being completed he worked on his new project, Johnston's Fluid Beef, for the civilian market. This Johnston's Fluid Beef, better known later by its name of *Bovril*, became a great success, and was one of Canada's most popular winter drinks.

Some of the batch mixing pans in which "Bovril" is made.

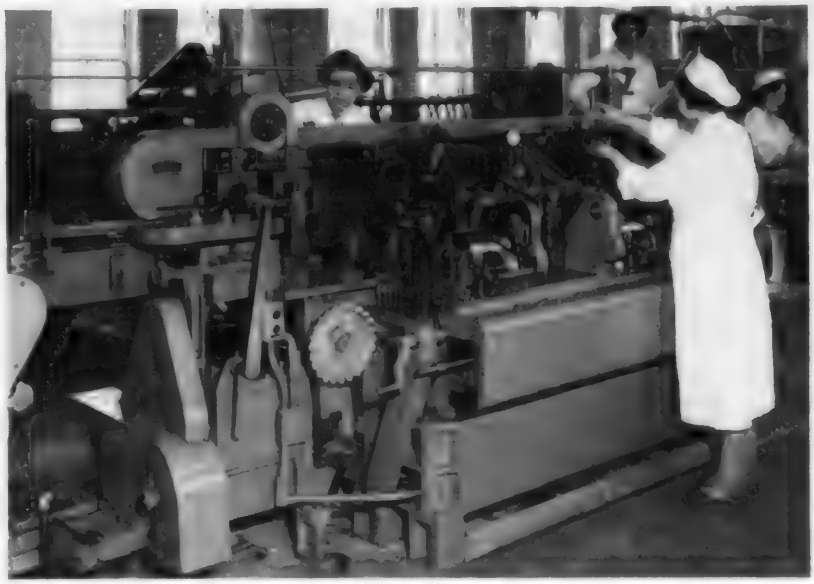
In 1884 John L. Johnston came home after selling his Canadian interests and started afresh in London, with a staff of one man and a girl. The following year he started a small factory in Trinity Square, and in 1886, at one of a series of exhibitions, had a stall where *Bovril* could be tasted, and where he gave lectures to the bystanders on dietetics. The increasing good name, goodwill, and sales of Bovril necessitated the formation of the Bovril company in 1889 with a share capital of £150,000. In 1896 it was £2 million, and today, excluding pastoral and associated companies, stands at £3½ million.

Expanding business drove the factory from Trinity Square to Farringdon Street, and from there to its present large site in Old Street. Increasing demands caused serious supply problems, and attention was devoted to sources of supply from South America. The turn of the century saw heavy requirements both by public demand and by War Office contracts for troops in the Boer War. By 1908 when Bovril was under the leadership of the founder's son, George Lawson Johnston, later the first Lord Luke, it was decided to establish ranches in the Argentine, and the first half

(*Left*): "Bovril" bottles being filled in a Karl Kiefer rotary filler. (*Right*); A close-up of one of the machines capping bottles of "Bovril."

million acres were purchased for the raising of cattle for *Bovril*. These ranches now extend to over 1,000,000 acres, and carry some 200,000 head of cattle. These cattle, together with supplies from privately owned ranches, form the source of supply to the Bovril factory at Santa Elena in the province of Entre Rios, where the ingredients of *Bovril* and corned beef are produced.

Interests of the Bovril company now cover many other products besides proprietary beef extracts, one of the most recent additions to the family being the well-known *Jaffajuce* Gold Cup brand of fruit squashes which are made partly at the Old Street factory as well as in the Jaffajuce factory in Glasgow.



One of the labelling machines which applies labels simultaneously to both sides of "Bovril" bottles.

Manufacture of Bovril

Great importance is attached to the standardisation and uniformity of composition of all *Bovril* manufactures. With this end in view the first stage of manufacture is controlled by the preliminary analysis of all raw materials which are supplied in bulk form from Argentina, Australia, and New Zealand. Carefully calculated quantities of materials are blended in batches of 2,400 lb. in stainless steel jacketed pans fitted with variable speed, electrically driven stirrers. Temperature and heating time in these pans are controlled by precision automatic equipment, and when blending is finished each batch is pumped through fine mesh stainless steel sieves to glass lined storage tanks of 5 tons capacity, fitted with slow moving agitators.

Automatic bottling

Bovril is fed by gravity from the storage tanks through glass lined and stainless steel pipes to a series of filling lines. Each of these lines consists of modern automatic filling, labelling, and capping machines. The whole filling operation has recently been re-equipped with machinery which can deal at adequate speeds with the rather difficult shape of the traditional *Bovril* bottle. Considerable ingenuity had to be devoted to the design of these machines, particularly in respect of the simultaneous application of front and back labels, with the utmost precision, on the glass panels of the bottle.

All bottles used are fresh new bottles from the glass manufacturer, which have been loaded on wire mesh trays, washed, and sterilised in modern washing machines. Great attention has to be paid to the examination of bottles as all possible chips, cracks, or other imperfections in the glass must be eliminated.

Two of the three filling lines

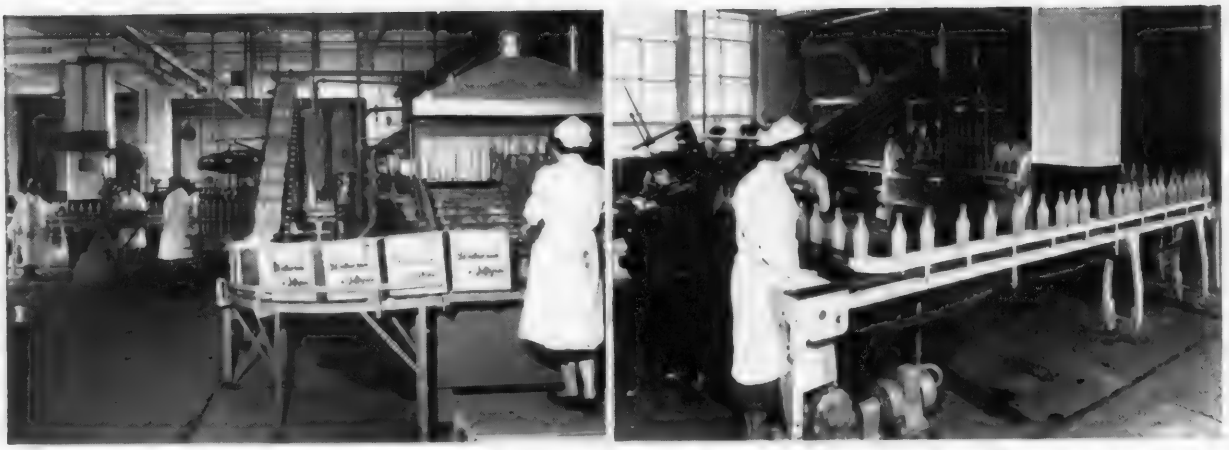
The "Jaffajuce" plant, showing orange concentrate being pumped from the 40 gal. casks, in which it is shipped, to the stainless steel manufacturing pans. The A.P.V. pasteuriser is in the background.

which can handle the 2 oz., 4 oz., or 8 oz. bottles work at a maximum rate of 120 bottles per min., while the third line, which can operate on the 8 oz. and 16 oz. bottles, has a speed of 60 bottles per min. The labellers on the two high-speed lines are Duplex Direct Transfer machines, and the slower speed line has a Simplex Direct Transfer machine. As precision filling is essential for a valuable product of this type, volumetric fillers are used which are constantly checked for accuracy.

The filled bottles pass immediately under cover by automatic conveyor to the capping machine where preformed screw thread caps are applied to the bottles by pneumatically controlled capping chucks, applying a very accurate degree of tightness to the caps of all bottles. The capped bottles pass by a conveyor to the labelling machines previously mentioned. As the filling, capping, and labelling are continuous processes, any stoppage in the final stage, that is, labelling, automatically brings into operation a stoppage of the two previous sections. After labelling the bottles pass the final examination before being loaded into prepared outer cartons, which then pass by conveyor to the carton sealing machine which is of the self-adjusting compression type, capable of dealing with all cartons varying in size from 3½ to 7½ in. depth at a rate of up to 20 cartons per minute. These sealed cartons are fed into a three-bay vertical tray swinging elevator which takes them to the stockroom for storage.

Jaffajuce

Jaffajuce manufacture is carried out in a section of the factory at Old Street situated on two floors. On the upper floor batch preparation is carried out and fed by gravity to the filling and labelling section below. *Jaffajuce* is made from concentrated orange juice imported in 40-gallon casks. Concentrate is pumped to one of a series of stainless steel batch tanks. Cold water syrup is prepared from fine granulated sugar in an open topped stainless steel vessel, and is transferred to the batch tank with the orange juice and remaining ingredients. Here again, as for *Bovril*, the utmost attention is paid to the preliminary analysis of the raw materials, and to the standardisation of the composition and quality of the product. When the tests on composition have been completed the batch is passed through a high temperature short time pasteuriser, and the cooled juice is transferred to a sealed holding tank. Passing through to the floor below this feeds a vacuum filler where it meets the clean new bottles coming freshly washed and sterilised from the bottle washer. The filled bottles pass to the capping machine which applies the preformed screw thread caps, and then on to the automatic labeller which fixes both front and back labels simultaneously to each bottle. The labelled bottles after examination are packed into the cartons. These cartons are those in which the bottles were originally supplied from the glass manufacturer, and as the bottles were loaded into the washing machines the cartons had been despatched by conveyor to meet the filled bottles discharged from the end of the labelling ma-



Two views of the "Jaffajuce" filling department. (*Left*): New bottles are emptied from their cartons and pass through the washing machine, thence to the rotary filler and the capping machine. (*Right*): After capping, the bottles pass the inspection point to the labelling machine shown on the left.

chine. This squash line is capable of an output of 60 bottles per min., which can be used either for 26 or 20 oz. bottles, both of the proprietary shape or any other standard shape of squash bottle.

Hygiene

Throughout the *Jaffajuce* section, as indeed with the rest of the factory, the greatest emphasis is given to hygiene, and every care is taken to see that premises, equipment, as well as staff are in no danger of contaminating the products in the factory.

Research Department

Comparatively recently the Research Department has been reorganised as an independent section free from routine control of production. The greater part of its attention has been devoted to fundamental problems of nutrition. During our visit we were able to see much work being carried out on problems such as the evaluation of protein quality and the composition and biological properties of meat extract. These are two major lines of work which have been developed with some success. Protein quality is being evaluated by two parallel methods, biological assay by carcass analysis and amino acid analysis by ion-exchange chromatography. The department breeds its own experimental animals for biological assay, and the two methods are being used in an attempt to correlate composition and nutritional value. The department has some work on hand in collaboration with the Food and Agriculture Organisation of the United Nations in examining the nutritional value of protein foods which may be proposed for feeding under-developed communities.

Analysis

In the field of the composition and biological properties of meat extract, a complete analysis of commercial meat extract has been carried out by paper chromatography for the first time. This has been compared with muscle extractives and is being followed by an examination of the biological properties. One interesting development is the discovery that a hitherto unidentified component is responsible for stimulating gastric secretion. An *in vitro* technique of using the isolated toad stomach in the Warburg apparatus in conjunction with chromatography is yielding interesting results. A parallel investigation on the rat makes use of the liberation of a dye from a dye-resin complex under the influence of acid secreted in the stomach. The dye is excreted and collected beneath the cage in which the rat is kept.

The degree of success in both these fields of research is indicated by the fact that members of the research department have published or read before learned societies nineteen papers during the five years since it was established.

The Fruit Annual

A DESCRIPTION of mechanical harvesting equipment and experimental tree shakers and catching frames is included in the latest edition of this year book and directory,* which is a comprehensive guide to the world fruit industry. Commencing with a survey of crops, sales and consumption in all the important countries, it has sections dealing with tropical fruit, dried fruit and nuts, an international register of fruit packages, a dictionary of fruit terms in five languages, a fruit supply calendar listing the country of origin of each fruit for each month of the year, a world list of trade organisations, a fruit shippers' guide, lists of exporters, producers, importers, suppliers and wholesalers of produce and machinery, cold storage and transport facilities, a list of trade marks, a buyers' guide and a list of journals, among which is FOOD MANUFACTURE. The sections are divided by labelled markers for quick reference.

* *The Fruit Annual*, 1959. British Continental Trade Press. Pp. 637. £1 net.

Experiments in Cooking Sardines—II

By R. Meesemaecker and Y. Sohier

Experiments were carried out at the Laboratoire de la Federation des Industries de la Conserve du Maroc, Casablanca, on behalf of the International Permanent Committee on Canned Foods. Last month the authors described cooking in water, brine and oil; this concluding article deals with cooking in hot air and in steam and summarises the results.

III. COOKING IN HOT AIR

FOR several years the method of cooking sardines in hot air has been favoured to such an extent that in some countries, such as Spain and Portugal, it has been replacing the process of cooking in steam. In a very short time four or five continuous tunnel ovens were offered to European manufacturers, and the trend persists in spite of the immediately obvious objections: poor heat conductivity of air, which increases cooking time and temperature; risk of changes in proteins due to heating at too high temperatures; danger of oxidation of the fats in the fish over which considerable volumes of hot air are passed, etc.

On the other hand, cooking by radiant heat in the form of infra-red radiation, which can be compared with hot-air cooking, does not appear to have had the success on an industrial scale which it merits.

However, it may be noted that the method of cooking in hot air alone has not appeared to machine manufacturers to be the ideal process. One of them has thought fit to combine it with infra-red radiation, while another has used a mixture of air and superheated steam. Finally, the one who seemed to be the advocate of hot-air processing advised spraying with oil during the operation.

Experimental technique

Our rather primitive experimental machine consisted of an electric oven altered in such a way that a current of air previously heated to the same temperature as the oven could be passed through it. The hot-air cooking chamber had a capacity of 70 litres; exhausting of hot air at the rate of 20 l. per min. achieved replacement of the hot air in the stove within 4 min.

Cooking was carried out both in the cans and on grills. The same standard grills were used in both cases. In fact, in its simplest form the method of cooking in cans either in steam or in hot air was carried out as follows: the sardines were packed raw and the filled cans were arranged on inclined grills *with the open end downwards*, so as to allow complete drainage of exuded liquids as they were formed. The grills were introduced into the oven, hot air, or steam, and subjected to the action of the heat for the time required to achieve complete cooking of the fish. On taking out of the oven the cans were taken from the grills, oiled immediately, sealed, and sterilised in the autoclave.

For our experiments with cooking in hot air we chose three different temperatures (100, 130, and 160°C.) and four cooking times (15, 30, 45, and 60 min.), making a total of 24 lots containing 144 cans, a thousand or so weighings, and 215 analyses. This is pointed out in passing to emphasise how long and laborious technological researches can be.

Results obtained

Examination of the results obtained (Table VII) shows that the general rules of cooking which we have already formulated apply also to the case of cooking in hot air, on grills, and in the can; the losses increase with the temperature and with the cooking time. On the other hand the volume of exudate in the covering oil in the canned product decreases under the same conditions.

If the value of this exudate as a test of cooking is admitted, the examination of our experimental results gives some useful information. Let us look in turn at cooking on grills and cooking in cans. In the first case for a 60 min. cook the weight of exudate per 100 g. of prepared sardine is:

11·3 g. when cooked at 100°C.
2·9 g. ,, ,, ,, 130°C.
2·2 g. ,, ,, ,, 160°C.

(The last two figures would correspond to 3·5 g. and 2·7 g. of exudate in the drained oil from a can of sardines, size 1/6 P.)

It would be correct to consider a cook of one hour at 160°C. as insufficient, whereas other results give the impression that it has exceeded the optimum limit. In fact, the abnormally high figure for "total loss" and, again, the fall in the sum "water + fatty matter" in the cooked fish, which has fallen to 68, we consider to be certain indications of excessive and undesirable drying of the organic matter. A sardine treated in hot air at a high temperature could therefore at the same time be both insufficiently cooked in the centre and show signs of degradation of the surface proteins.

Experiments on cooking at 160°C. prolonged beyond an hour would probably have thrown more light on this important aspect of cooking in hot air.

Concerning cooking in cans, the weights of exudate were as follows:

16·1 g. when cooked at 100°C.
8·3 g. ,, ,, ,, 130°C.
6·1 g. ,, ,, ,, 160°C.

These figures should be compared with those for cooking on grills.

Such comparison shows the relative slowness of cooking in cans, as would be expected. However, the fact that it is incomplete in all cases does not prove that the cooking of sardines in hot air is impracticable. For one thing we have no means of comparing the times of cooking in our laboratory oven with those in the industrial tunnel-ovens. That which we failed to achieve in one hour's heating at 160°C. might perhaps be achieved in less time in an appropriate machine.

Furthermore, it may be noted that if it is true that cooking in the can is slower than on the grill this disadvantage is partly balanced by a notable increase in the capacity of the grills used and consequently of the throughput of the machine.

The slowness of cooking in hot air is the essential characteristic of this process. It will appear more forcibly by comparison with cooking in steam which we are about to consider.

IV. COOKING IN STEAM

The method of cooking in steam is that about which we know the most, having devoted to it many months of research into the manufacture of canned sardines in Morocco. We chose it because it is the most commonly used process in the Moroccan industry. Furthermore, between cooking on grills and cooking in cans we chose the latter method, which is becoming generally accepted in Morocco.

However, for the purpose of this paper, cooking experiments were carried out simultaneously on grills and in cans. They were conducted like those on cooking in hot air with fish of almost identical composition and with the hot air oven replaced by an expanded steam chamber at 100°C.

Examination of results

The results of these experimental packs are contained in Table VIII, from which some interesting figures may be extracted.

Examination of the losses on cooking shows that under the exact conditions of our experiment, cooking in cans is exactly 15 min. behind cooking on grills. The same is not true of losses of exudate. The lag of one method of cooking behind the other increases considerably for the obvious reason that in the case of cooking in cans and in spite of their inverted position, the exudation of the liquids of composition of the fish takes place with some difficulty.

Table VII. Cooking in hot air

Losses of weight on cooking and weight of exudate in oil (figures calculated to 100g. raw fish)

Cooking temperature	Cooking time (min.)	Cooking on grill: Weight losses on cooking	Cooking on grill: Weight of exudate	Cooking on grill: Total losses (cooking+sterilisation)	Cooking in cans: Weight losses on cooking	Cooking in cans: Weight of exudate	Cooking in cans: Total losses (cooking+sterilisation)
100°C. ...	15	4·5	17·6	22·1	1·0	21·4	22·4
	30	8·0	18·0	26·0	4·0	21·4	25·4
	45	12·1	14·2	26·3	5·6	20·1	25·7
	60	14·8	11·3	26·1	10·1	16·1	26·2
130°C. ...	15	6·0	18·1	24·1	2·4	20·9	23·2
	30	13·6	11·5	25·1	8·4	16·4	24·8
	45	20·3	7·9	28·2	17·8	11·3	29·1
	60	25·7	2·9	28·6	19·2	8·3	27·5
160°C. ...	15	10·0	16·8	26·8	2·4	21·7	24·1
	30	23·3	6·5	29·8	17·0	9·3	26·3
	45	28·1	3·4	31·5	21·5	8·4	29·9
	60	30·2	2·2	32·4	22·6	6·1	28·7

Table VIII. Cooking in steam at 100°C. on grills and in cans

(Variable times)

Method of cooking	On grill				In cans			
Cooking time (min.)	15	30	45	60	15	30	45	60
I—Fabrication:								
Weight of raw fish per can	118·6	116·8	120·6	121·1	123·0	122·0	122·5	125·1
Weight of cooked fish per can	90·7	85·4	87·8	86·5	98·0	93·7	89·5	90·7
Weight of covering oil per can	35·9	40·1	37·6	39·5	28·0	31·4	35·1	33·9
Net weight per can ...	126·6	125·5	125·4	126·0	126·0	125·1	124·6	124·6
Loss on cooking per 100g. raw fish	23·5%	26·8%	27·2%	28·6%	20·3%	23·1%	26·9%	27·5%
II—Examination of canned fish:								
Drained weight of fish per can	91·0	87·1	91·0	90·1	95·1	93·9	92·0	92·8
Weight of drained oil ...	32·5	37·4	33·9	35·9	24·3	27·5	30·5	30·1
Weight of exudate in oil per can	3·1	1·0	0·5	Traces	6·6	3·7	2·1	1·7
Quantity of oil absorbed per can	+3·4	+2·7	+3·7	+3·6	+3·7	+3·9	+4·6	+3·8
Weight of exudate after sterilisation } per 100g.	2·6	0·8	0·4	0·0	5·4	3·0	1·7	1·3
Total losses (cooking+sterilisation) } raw fish	26·1	27·6	27·6	28·6	25·7	26·1	28·6	28·8

Table IX. Cooking in steam at 100°C. in cans

Quantity of water exuded during sterilisation at 115°C. relative to the cooking time and the fat content of the fish

(Results expressed in g. and calculated to 100g. of raw fish)

Cooking time in steam at 100°C.	Lean sardines (2% of fat)	Semi-lean sardines (7·5% of fat)	Fat sardines (17% of fat)
10 min.	8·0	4·0	2·8
20 ,, ...	3·2	2·4	1·7
30 ,, ...	2·6	1·4	0·7
40 ,, ...	1·5	0·8	0·2
50 ,, ...	0·9	0·6	0·1
60 ,, ...	0·3	0·5	0

The Laboratoire de la Federation des Industries de la Conserve du Maroc, Casablanca, where the experiments described in this and the previous article were carried out.

Another comparison of interest is that of losses on cooking and weights of exudate obtained, at the same temperature, with different methods of cooking.

The following table classifies these results for a cook of 15 min. at a temperature of 100°C.

Cooking method	*Losses on cooking*	*Weight of exudate after sterilisation*
Steam (on grill) ...	23·5	2·6
Oil	22·1	8·8
Water	14·8	10·2
Hot air (on grill) ...	4·5	17·6

Cooking in expanded steam at 100°C. is most rapid, closely followed by cooking in oil. The process in hot air is least favourable, long after cooking in water which, however, is carried out under particularly unfavourable conditions.

In less than 30 min. the weight of exudate fell to 0·8 g. in the case of steam cooking on grills at 100°C. This is a result which was not achieved after cooking for an hour in hot air at 160°C.

Up to now all our experiments have been concerned with lean sardines with a fat content between 1 and 5 g. per 100 g. of prepared fish. Obviously the results obtained could only be compared on condition that the sardines used had as nearly as possible the same composition. Now we have stated incidentally, and without supporting figures, that the optimum cooking time was determined primarily by the fat content of the fish and that, other things being equal, very lean sardines could take twice as long to cook as very fat ones. We propose to demonstrate this, drawing the results we require from our previous work.

During the fish season of 1955, many sardines in oil were cooked in the cans in steam at 100°C.; sardines with fat contents from 1 to 17% were used. On many occasions we have cooked for various times, at ten-min. intervals up to one hour. The products in oil gave on draining the weight of exudate in the covering oil. These are the figures found on weighing products made from lean, semi-lean, and fatty sardines which are assembled in Table IX and which we propose to interpret.

Different cooking times necessary for lean and fat fish

According to the cooking time and the fat content of the fish, the weight of exudate calculated per 100 g. of raw sardine varies from 0 to 8 g. In the case of lean fish the quantity of water exuded into the oil can reach 8 g. for a cook of 10 min. and falls to 0·3 g. after a cook of one hour. With very fatty sardines, the weight of exudate in the oil is no more than about 3 g. for the same 10 min. cook and falls to 0·2 g. when the cooking time is raised to 40 min. It is therefore necessary to cook lean sardines much longer than fatty sardines if it is desired to avoid the presence of abnormal quantities of exudate in the oil covering the canned fish.

Thus, in order not to exceed 1·5 g. of aqueous exudate per can the cooking must be continued for 40 min. if the sardine is very lean and reduced to 20 min. if the fish is very fat. The difficulty for the manager who has no laboratory or who lacks experience is to know the exact cooking time which suits the fat content of the sardine. Determination of the aqueous exudate in the covering oil will tell him, after manufacture, if the cooking time has been long enough.

V. COOKING IN TWO MEDIA

It now remains to examine the special case where an industrial cooking method uses successively two different media. The first is most often boiling water, brine, or steam, and the second is always hot air. This latter part of the process is called drying.

Drying of sardines after cooking

It did not occur to us to carry out some experiments on drying in hot air with our preparations of sardines cooked in boiling water after canning raw, but we have no illusions as to the results that might be expected. Remember that after cooking for 30 min. in boiling water we still found 6·6 g. of exudate in the drained oil of the prepared canned fish. Certain comparisons allow us to suggest that it would require at least an hour of "drying" in hot air at 100°C. to eliminate the major part of this water of composition.

On the other hand, we carried out numerous experiments on "drying" sardines after cooking in cans in expanded steam at 100°C. The first conclusion to be

drawn from these experiments is that this drying in air above 70°C. is unnecessary when the cooking in steam has been carried to completion. We know that a proper cooking time is sufficient to prevent any exudation into the covering oil. Possibly a part of the time of cooking in steam can be replaced by "drying" in hot air at 100°C., but in such a case the cook in steam will have been simply followed, in fact, by cooking in hot air. However, when it is a matter of cooking in steam on grills, drying is necessary because it makes the flesh firmer and facilitates handling and filling of the fish into cans. Drying in hot air of the fish cooked in cans may also improve the appearance of the finished product.

It should also be pointed out, in another connection, that moderate drying, in the can or on a grill, increases the quantity of covering oil absorbed by the cooked fish and, in so doing, improves the quality of the canned product.

The same is not true of a prolonged drying at 100°C. because this causes a severe desiccation of the flesh and results in a hard, brittle, and dry-looking sardine. However, this dry sardine is not lean but rather the contrary. Thus it is that in the example quoted in regard to cooking in oil of sardines dried five hours at 100°C., the respective water and fat contents of the drained fish were 52·6% and 16·4% compared with 66·3% and 6·4% for sardines just cooked and not having been submitted to any drying. We stated then that the greasiness of a sardine does not depend entirely on its fat content but rather on a suitable balance between the quantities of water and of fat that it contains.

SUMMARY

We have referred frequently to water of composition of the sardine, to losses on cooking, and to exudate in the covering oil, but we have only considered the quantitative aspect of the question, which may be summarised as follows: during normal cooking sardines lose 20 to 30% of their weight according to their fat content.

Some writers have drawn attention to the necessity of avoiding as far as possible the loss of nutritive principles from the fish; according to them this represents an appreciable reduction of its food value.

There are two methods of determining qualitatively the nature of the losses during cooking:

1. by comparing the composition of the raw fish with that of the cooked fish, taking into account the loss in weight of the fish;
2. by analysing the liquid exuded during cooking and carefully collected. This is the "cook-drip" of the Americans.

Both methods are valuable and are complementary. We have applied them to the cooking of sardines in steam at 100°C.

The result obtained on a fatty, beheaded, and cleaned sardine containing 14% of muscular fat is as follows:

After suitable cooking this fish had lost 20% of its weight (which represents 27% of the water it contained), 8% of its fat, 8% of its nitrogeneous matter, and about 10% of its mineral content.

Calculated on the basis of 100 g. of raw sardine the loss of calories reached 8·4%. It is apparent that there is no cause for undue anxiety over these unavoidable losses.

From the numerous "cook-drip" tests we have carried out we have reached two conclusions:

1. Cooking of sardines, even in boiling water, involves a concentration of the nutritive principles. In other words, *weight for weight*, the cooked product has a higher nutritive value than the raw material. This principle applies generally to all food of animal origin.
2. Contrary to an opinion very widely held, cooking does not cause any appreciable reduction in the fat content of sardine meat. In other words, the sardine does not readily lose its muscular fat. The oil which runs plentifully from the cookers, or which floats on cooking tanks when fat fish are being used, results almost entirely from partial melting of the fatty masses in the abdominal cavity and, in certain cases, from fusion of the subcutaneous fat.

Essential principles enumerated

We wished to show by what process of experiment and analysis we have been able to establish several essential principles regarding the cooking of sardines. At the risk of repetition, it seems to us useful to set these out in a summary as concisely as possible:

(*a*) During cooking, whatever process is used, sardines lose 20 to 30% of their weight. This loss of weight increases with the temperature and time of cooking, and varies inversely as the fat content of the fish.

(*b*) The optimum cooking time for sardines is primarily determined by the fatty condition of the fish: a lean sardine must be cooked, all other things equal, much longer than a fat sardine.

(*c*) In the case of canned sardines in oil, the water of composition which is not eliminated by a sufficient cook is found in the covering oil after sterilisation of the can contents in a retort.

(*d*) The presence of a noticeable quantity of aqueous exudate in the covering oil in canned sardines is always a sign of insufficient cooking of the fish. Measurement of the water in the drained oil is therefore a good method of controlling the time of cooking.

(*e*) "Drying" in hot air considered as additional to cooking is unnecessary if the cooking has been well carried out for a suitable time. However, "drying" of sardines after cooking in steam is still justified in so far as it facilitates handling of the cooked fish and improves the final appearance of the product.

(*f*) During cooking in steam sardines lose about 10% of their dry matter and 5 to 8% of their calorific value.

(*g*) In general, cooking does not cause an appreciable fall in the fat content of sardine muscle.

(*Concluded on page 204*)

FOOD MANUFACTURE
ANNUAL REVIEW

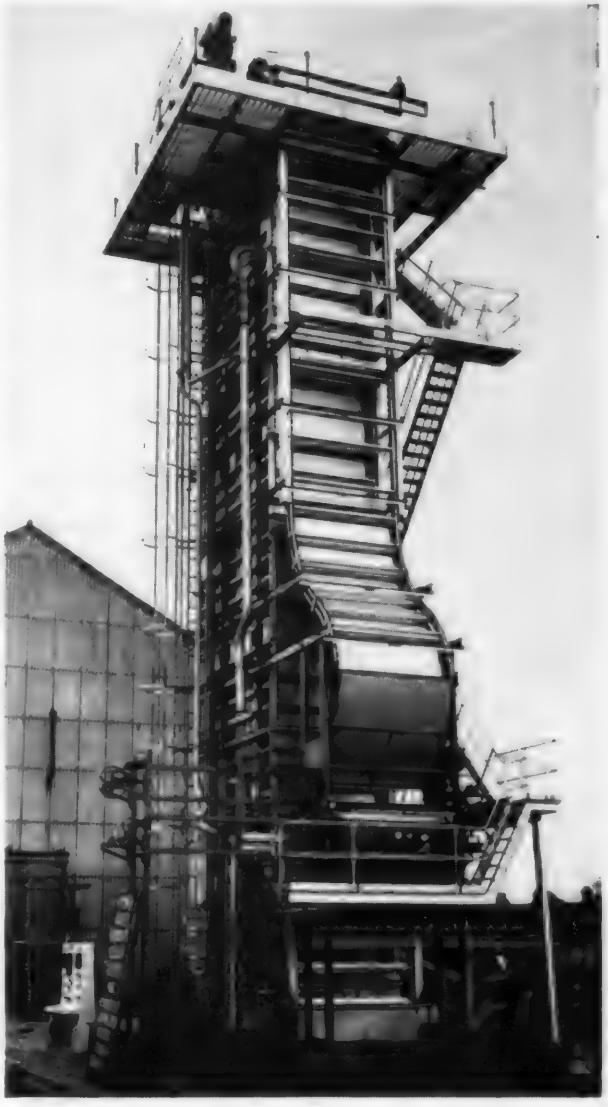
Fruit and Vegetable Canning and Freezing

By Denis Dickinson,* M.Sc., Ph.D., F.R.S.H.

Larger machines ★ Hot-air sterilisers ★ Mechanical harvesting
Pesticide residues ★ Food poisoning ★ Frozen food

ONE aspect of modern industry which causes great concern to many people is its tendency to amalgamate into ever larger groups to the virtual exclusion of the small independent trader. The fruit and vegetable preservation industries have provided some outstanding examples of this, and one of the reasons for it must surely be the increasing need for capital to equip a cannery with the modern high speed machinery required today. There are doubtless other reasons, such as the changing pattern of wholesale distribution; but there can be no argument that the capital cost of a modern high-speed continuous cooker is beyond the means of the small company.

These machines appear to have been getting bigger. The non-agitating continuous pressure cooker was not a very large machine; the rotary type is generally bigger and more impressive. The use of the hydrostatic principle in the Carvallo cooker introduced height as a necessary factor, and as this has been developed it has become almost customary to build special structures to house such giants as the Mitchell-Webster machine illustrated. The original idea of the hydraulic pressure system was simplicity, to eliminate the mechanical valves necessary to maintain the different compartments of a continuous pressure cooker at various pressures. This objective has been achieved, but the hydraulic system has brought other difficulties peculiar to itself, one of which is corrosion. To overcome or to avoid this requires special attention to the metals used in construction and to water treatment.



A Mitchell-Webster hydrostatic vegetable steriliser supplied to H. J. Heinz and Co., Ltd., of Canada.

Hot-air sterilisers

Another way of avoiding the use of pressure valves is to dispense with pressure altogether. Several claims have been made for patents on the use of vapours other than steam which can be heated to high temperatures without the need for pressure vessels.[1] So far as is known, none of these processes

* Fruit and Vegetable Canning and Quick Freezing Research Association.

is yet in industrial use. On the other hand, attempts to use hot air as a means of conveying heat to cans have been successful. One such system was described by Cheftel and Thomas[2] and the present author has been privileged to see such a machine in operation. The principle is simply that the cans enter a chamber of hot air through which they rotate as they travel; this brings them up to the required temperature. They are then passed with much slower rotation through a "holding chamber" where the temperature is maintained for the required time, and finally they are cooled.

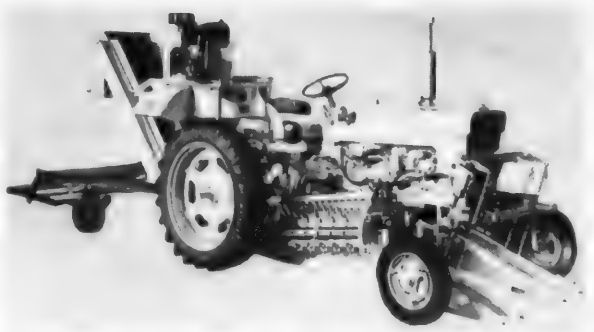
As there is no externally applied pressure the cans are under internal stress during the greater part of the process, so that only comparatively small cans may be passed through this machine without damage. The temperature of the air may be 200-300°C. The heat is generated in oil burners mounted on top of the processing chambers and it is passed via heat-exchangers into the machine. Precise automatic control is achieved together with economy by appropriate recirculation systems.

A particular advantage of the hot-air sterilisers is their independence of a steam supply. Another machine constructed in Sweden by A. Johnson and Co. and used for experiments at Camden Research Station was heated by electricity. The saving on steam pressure installation must go a long way to offset the cost of such machines which may therefore help to stop the ever-growing demands on the capital of the smaller firms. The successful application of hot-air machines, which are best suited to high-short processes, has so far been restricted to dairy products. Canned vegetables and, of course, fruits have been sterilised in prototype machines, but difficulties may arise from residual enzyme activity. However, such difficulties are inherent in the high-short process and have nothing to do with the heat-transfer medium employed.

In these days of increasing line speeds, no process or machine has any chance of success if it is likely to limit the rate of production. The hot-air cookers described both use the principle of multiple lines to attain high output figures—in the case of the French machine, up to 200 cans per min. according to size.

Mechanical harvesting

In order to cater for increasing speeds of cannery lines it has become necessary to arrange for ever more rapid transfer of raw materials from the field to the factory. Mechanical handling in the field is therefore becoming increasingly popular. Mobile viners for peas are now offered and may eventually replace the viner station. A canned vegetable pack of increasing popularity is the French bean, and machines for picking these vegetables have been introduced recently. Mechanically harvested materials usually require cleaning and, on receipt at the factory, peas or beans are now normally winnowed, destoned, washed and cooled before they arrive at the picking tables.



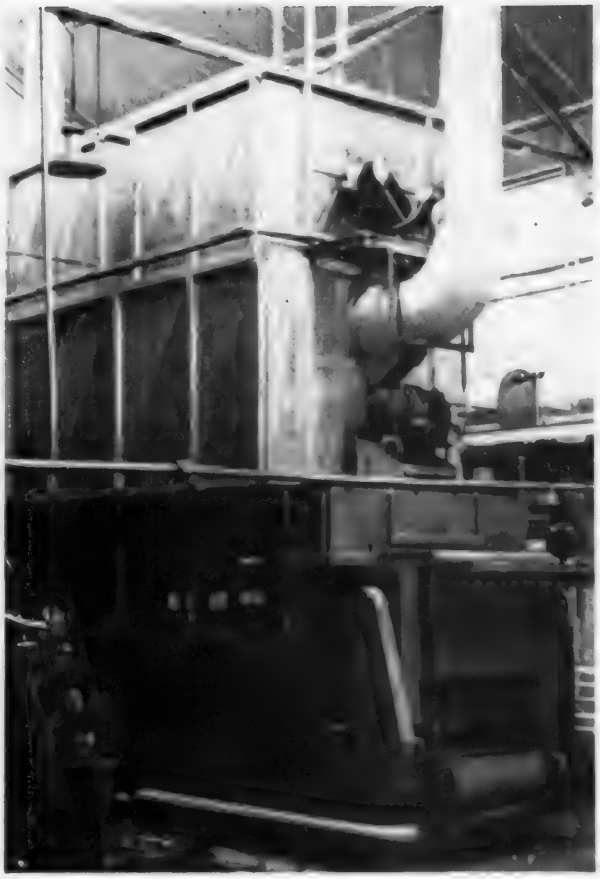
A machine for harvesting French beans, supplied in this country by Mitchell Engineering Ltd.

Pesticide residues

Increased rates of preservation are, of course, assisted by higher yields. These in turn are helped by preventing the ravages of insects. Modern pesticides are of many kinds and reach a high degree of efficiency in protecting crops against attack, but they bring new problems in the shape of the chemical residues left on the plants. These may introduce risks of poisoning the legitimate consumer (having already poisoned the unauthorised one) or they may simply spoil his appetite by affecting the flavour of the food. Many committees have considered the problems introduced by residues and in some countries, U.S.A. for example, limits have been set by regulations to the quantities of various chemicals which are to be considered harmless. European canners and technicians held a meeting on the problems of tainting during the annual gathering of the Comité International Permanent de la Conserve (C.I.P.C.) in Brussels in October; while some danger undoubtedly exists, it would seem that the risk of canned vegetables or fruits containing toxic quantities of spray residues is very small because of the destructive effects of weather and of the various canning processes. At present the biggest danger appears to lie in the unauthorised—or perhaps just careless—use of sprays too near to the harvesting date. Chemical manufacturers, distributors, horticultural advisers, and sometimes canners themselves, all urge upon growers the importance of certain minimum time intervals between the last spraying and the harvest date. In this country, the Ministry of Agriculture issues advice on the subject.[3]

An outbreak of poisoning

Food poisoning from canned vegetables is very rare, so that when it does occur it is unlikely to pass without notice. The report of the Chief Medical Officer of Health for 1957 contains an account of an outbreak of poisoning due to canned processed peas.[4] The organism responsible was *Staph. aureus* and it was definitely established that the same strain of organism was responsible in each case. All the cans involved in the reported outbreaks were the A10 size in use in canteens and restaurants and there were several people affected on each occasion. Further-



A hot air steriliser in use for the processing of flavoured canned milk. The furnace and heat exchanger are mounted on the top of the machine.

more, all the cans involved were packed at the same cannery.

Since *Staph. aureus* is a non-heat-resistant type of organism it was clear that the cans became infected after processing. The cooling water used always had a high chlorine content, which eliminated the cooling water as the vehicle of infection. An abnormally high proportion of the cans were found to have defective seams, and fresh peas canned at the same time and in the same cans gave up to 2·5% of blown cans. It was discovered in the laboratory that many organisms produced gas when cultured in canned fresh peas but not when they grew in processed peas. Included among these organisms was the one responsible for the food poisoning. Hence many of the infected cans of processed peas did not blow and thus passed through the normal distribution channels undetected.

It must be pointed out here that the level of infection with the *Staph. aureus* responsible for food poisoning was not 2·5%. This figure was the total of all cans infected through faulty seams; most of the infecting organisms were common types capable of spoiling the peas for food, but not in any sense dangerous. Only one or two cans per 1,000 contained the *Staph. aureus*, sometimes in addition to harmless organisms.

The ultimate source of the staphylococcal infection was found to be an operative with an undisclosed skin infection; her only contact with the cans was when unloading them from retort baskets. During such unloading, of course, even normal can seams are liable to minute leaks and as the seams are still wet there is the chance of entry of bacteria.

The combination of circumstances which led to this outbreak of food poisoning—involving 17 separate incidents—cannot be other than extremely rare. First, there must be the presence of the source of infection in the cannery, itself an uncommon occurrence; secondly, there must be the opportunity for infection, in this case a small proportion of faulty seams; thirdly, the cooling water must be sterile so as to prevent the more normal types of leaker spoilage which lead to blown cans and consequent rejection of leakers; fourthly, the nature of the pack must be such that the infecting bacteria do not produce gas when they grow in it. Finally, it is doubtful whether the infection would have been detected at all if the cans had not been the A10 size and thus led to the illness of several people on each occasion. A full report of this curious case is being prepared, and a number of questions raised by it are being investigated.

Frozen food

When such an unlikely chain of events actually happens it adds force to arguments in favour of precautions against much more probable occurrences. The anxiety being expressed about the bacteriological purity of certain frozen foods is now seen to be a most serious matter. Several committees have been formed to define bacteriological standards of purity for frozen foods, but little progress has been made because of the lack of data on which to base standards. A survey of the bacteriological quality of frozen foods would not be a particularly difficult operation, but it would require the full support of the industry, both moral and financial. In this country our food hygiene regulations may safeguard the home-produced article *as far as can be reasonably foreseen*, but they offer no protection against the increasing quantities of imported frozen foods. The italic phrase is significant not only because it refers to the occurrence of the unlikely, as exemplified by the outbreak of food poisoning through canned processed peas referred to above, but also because of some of the developments which have taken place during recent years involving the repacking in retail-size units of materials frozen in bulk during the production season. This often involves a partial thawing of the bulk stocks, followed by manual packaging with no intermediate blanching or other cleansing process applied to either food or package.

Bacterial food poisoning through the medium of frozen vegetables is unlikely if the vegetables are thoroughly cooked before serving; but it certainly is possible if the vegetables are thawed slowly and eaten in a raw state, as in salad.

Research on other aspects of frozen foods is proceeding rapidly overseas, particularly in the U.S.A., Australia, and Holland. A great deal of attention has been given to frozen fruits, for which there is an obvious potential market once the technical difficulties have been overcome. Studies of time-temperature tolerances of frozen raspberries, strawberries, and cherries have provided much useful information which can be applied to tracing the history of a particular pack.[5]

Standards of quality and fill

An outstanding event in the standardisation field in 1958 was the final agreement by the Fruit and Vegetable Canners' Association of a Code of Practice for canned fruits and vegetables in Great Britain. Standards of fill are based on filling weight, which is subject to a voluntary system of inspection. Syrup densities have been defined and again are "at the time of filling." It has been agreed to publish the code in the technical press and it is expected to appear in the very near future. Another important agreement was that of the I.S.O. list of standard open-top round cans,[6] a list subsequently confirmed at the C.I.P.C. meeting in October. The C.I.P.C. also agreed on a standard for tomato purée and paste which it is hoped will form the basis for commercial exchanges. This has aroused considerable interest and appears to have met with widespread approval, though it remains to be seen how widely it will be adopted by international buyers.[7]

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FOOD MANUFACTURE
ANNUAL REVIEW

MEAT

By F. J. Mallion, M.R.S.H., M. Inst. M.

Events of the year ★ Consumption and supplies ★ Technological developments ★ Imports ★ Poultry

THE year 1958 has been unusually eventful in the meat world. In the central distributing market of Smithfield, a strike of porters closed the market for ten weeks, a big fire destroyed one-fifth of the market, and, during the closing days of the year the main suppliers of our imported beef, Argentina announced through the Argentine Meat Board, a large reduction in supplies for 1959.

In late January a disastrous fire demolished a fifth of the London Central Markets (Smithfield), the market destroyed being "The Poultry," in which forty tenants transacted business. This market was built in 1875, and what was almost a new building (following war damage repairs completed two years ago), was gutted so severely that only a shell remained. The estimated loss was £1½ million.

A temporary market was erected on an adjacent site and opened on October 9, 1958, three weeks ahead of schedule. In the meantime, displaced tenants had shared "shops" in other parts of the market and, although overcrowded conditions resulted, market facilities and services showed a remarkable lack of disruption.

During May a trade dispute at Smithfield and at certain London docks resulted in a complete shutdown as far as meat supplies were concerned. During the dispute, which lasted ten weeks, some beef was flown from the Continent at the rate of 100 tons per day; this unfortunately added as much as 6d. per lb. to the cost, but it augmented the increased supplies of home-produced meats, and so meat continued to feature in the Londoner's diet.

Prices

From the consumer's point of view, the outstanding feature of the year was the sharp increase in beef prices during the late summer period. This was largely due to the decrease of supplies. In the three months ending September 30, total beef supplies were approximately 25,000 tons (7½%) less than

during the corresponding period last year. Lower imports accounted for about one-third of the shortage, the balance being caused by a reduction in home-produced supplies.

Average prices per lb. on Smithfield for the month of September in 1957 and 1958 are compared as follows:

	1958	1957
	s. d.	s. d.
Scotch sides	2 6½	2 0
English sides	2 4½	1 10
Argentine hindquarters (chilled)	2 8½	2 2
Argentine forequarters (chilled)	1 8½	1 1½

Slaughtering regulations

In the latter part of the year the Ministry of Agriculture, Fisheries, and Food made regulations permitting pigs to be anæsthetised by carbon dioxide gas in special installations at slaughterhouses in England and Wales. The gas process is already used extensively in North America and certain Continental countries. In Britain the process is most likely to be used at large bacon factories. The responsible authorities are satisfied that at the correct concentration carbon dioxide has no harmful effect on the meat.

CONSUMPTION AND SUPPLIES

It is pleasing to note the steady increase in average consumption per head, and provided that prices remain at a reasonable level, the overall increase is likely to continue. It should be noted that there is a persistent decline in the *per capita* consumption of mutton and lamb, despite the general rise in meat consumption, as is shown in the table.

Meat consumption (lb. per head)

	1934-38	1955	1956	1957
Beef and veal	54·9	46·2	52·8	53·7
Mutton and lamb	25·2	24·4	23·3	22·2
Pork	10·6	18·4	17·5	18·2
Offal	7·4	7·8	8·3	9·0
TOTAL	98·1	96·8	101·9	103·1
Bacon and ham	28·1	25·1	24·0	24·5

Output of carcass meat and offal, excluding bacon, in the first six months of 1958, was 9% greater than the comparable period of 1957, the bulk of the increase being in beef and pork. Imports of meat were reduced by 13%, therefore total supplies from home-production and imports were only slightly greater than January-June, 1957.

The upward trend in meat consumption appears to be continuing, pork being the most marked.

Canned meat consumption in the U.K. has also increased. The *per capita* consumption is now almost three times as great as before the war, being 9·1 lb. against 3·1 lb.

From June 30 changes in the Fatstock Marketing Scheme came into force; these emphasised the current consumer requirements for smaller, baby beef type, which is thickly fleshed throughout and well finished.

Home supplies

Pre-war home-production of beef accounted for approximately 51% of total supplies, today it is some 65%, while home-production of mutton and lamb shows a decrease of 2% from 38% in 1938 to 36%, being down from 211,000 tons to 193,000 tons.

In the field of pig-meat production the combined figures of home-produced pork and bacon, which represented 49% of our total supplies in 1938, have increased to such a degree that they now provide 64% of our total supplies.

Home-production in the United Kingdom during 1957 at nearly 1,520,000 tons, was 2% greater than the previous year and 35% above the pre-war figure. Results of the September, 1958, agriculture census for England and Wales show that all classes of stock have increased when compared with September, 1957.

Cattle totalled 8,199,000, an increase of 43,000 (0·5%). Sheep increased by 1,595,000 (11·4%), totalling 15,592,000. The number of pigs was 5,667,000, an increase of 284,000 (5·3%). Poultry was up by 5,481,000 (8·8%).

Imported supplies

The aggregate of imported supplies for the ten months ending October 31, 1958, is 628,400 tons, a drop of 87,000 tons on the total at the same period last year. Beef shipments, 323,700 tons are over 70,100 tons down. Mutton and lamb at 290,000 tons being 9,900 tons less, and pork 7,500 tons down on an aggregate of 14,000 tons. Of the beef supply, 208,900 tons was "chilled" compared with 229,000 tons at the same time last year.

TECHNOLOGICAL DEVELOPMENTS

Measures adopted to increase home-production during recent years include crossing beef bulls, such as Hereford and Aberdeen-Angus with pedigree dairy cows, using artificial insemination. The resultant calves inherit the known dominant characteristics of the sires, becoming colour-marked, which indicates their beef potential under suitable conditions of feeding and management. This practice has increased to such an extent that there is now some danger that the reduced breeding of pure dairy animals will unduly deplete the dairy herds.

Artificial insemination from beef bulls on dairy cows has increased very rapidly over the years. In 1951-52 it accounted for 12% of all inseminations, 1954-55 15%, 1955-56 25%, and now it accounts for 35%.

This increased use of artificial insemination reduced greatly the number of dairy calves slaughtered in the autumn, and it has been estimated that the increase in home-produced beef, judged by the insem-

ination figures, would be approximately 10% during the next year or two.

Research into other methods of increasing home-beef production was directed towards inducing cows to produce twins rather than single calves. This has proved successful with sheep. The technique requires correct administration of hormone and, given this, cows will produce twins. Though still experimental at this time, it appears that shortly large-scale field trials on commercial herds will be carried out, and if successful, a terrific boost will be given to home-production.

Experiments have also been successful in the removal of fertilised ova from a good-quality ewe and transplanting them into a poorer-quality ewe, the second ewe then producing a good-quality lamb. Difficulties experienced suggest that until an easier method of transferring the cells is found, this technique is not a commercial proposition. Nevertheless, if perfected, it would increase both meat quantity and quality.

Hormone implantation

In commercial herds the use of hormones, either implanted as an addition to feeding, for increased growth rate in the final finishing period of cattle and sheep, appears to have subsided during past months, principally by reason of the side-effects it might produce in the physical and chemical composition of the treated carcass. Research has progressed and preliminary results suggest that many of the fears may not actually be well founded, particularly those of soil-contamination. It is probable that in the future the hormone treatment of livestock will again become prevalent. In the U.S.A. it is estimated that 90% of fattening cattle are treated.

Tuberculosis eradication

The Minister of Agriculture, Fisheries, and Food intends to extend the free tuberculin testing of cattle to the remaining parts of the country, and on March 1, 1960, to declare the two final areas of England as "tuberculosis eradication areas." There is therefore a good prospect that the whole of Great Britain will be an attested area by 1961.

At the end of 1957, there were 7½ million cattle in attested herds and areas in Great Britain, as compared with 2 million in October, 1950, when the plan was introduced. Approximately 76% of cattle in Great Britain are now attested; (in England 70%, in Wales 93%, and in Scotland 92%).

The Minister of Agriculture, Fisheries, and Food announced free tuberculin tests of cattle, commencing March 1, 1958, in the remaining areas which it is intended to declare as tuberculosis eradication areas in two years' time. The areas are as follows:

(*a*) Northumberland and the remainder of Durham;

(*b*) Cheshire, Derby, Huntingdon, Isle of Ely, Leicester, Lincoln, Nottingham, Rutland, Stafford, Yorks (East, North, and West Ridings), and the remainder of Lancashire, Northampton, and Warwick.

The purpose of free tests is to encourage the farmer to clean up his herd. Provided he applies in good time and complies with the Ministry's requirements, free tests of the herd will be continued until it qualifies for entry to the Attested Herds Scheme and for bonus payments under the scheme. These payments are 2d. a gallon on milk sales for four years followed by 1d. a gallon for a further two years; or a capitation bonus of £2 a head of cattle a year for four years followed by £1 a head for a further two years.

Preservation

Research is continually directed towards increasing storage life and enhancing the appearance of meat. With the increasing incidence of *Cysticercus bovis* (measles in beef) in many areas, it is worthy of note that the use of polythene bags has been successfully introduced for subsequent freezer storage. This wrapping offsets the dehydration and discoloration, which occurs in meat when subjected to freezing, on account of this parasitical condition. (Meat so affected is required to be frozen for at least two weeks at a temperature not exceeding 14°F., or at 20°F. for not less than three weeks.) Covering of the meat with polythene material prior to freezing ensures retention of much of the natural "bloom," the treated carcass being similar in appearance to good quality chilled meat.

British Railways recently introduced into the Continental traffic 70 "Interfrigo" meat wagons fitted with electrical ventilation. This is a great improvement, particularly at low speeds, and the elimination of overhead ducts gives greater headroom for the carriage of large quantities of meat.

Antibiotics and irradiation

A combination of antibiotic treatment and irradiation may be a way of extending freshness of perishable goods. Antibiotics control the bacteria which cause putrefaction, while irradiation inactivates or sterilises the cells of the food.

The antibiotic aureomycin-chlortetracycline, in low concentration, will approximately double the storage life of meat, poultry, and fish. Irradiation may cause "off" odours and flavours to develop and can change the appearance of the food.

Experiments with a combination of these treatments have proved successful when low levels of irradiation are employed.

Micro-wave freeze-drying technique

American scientists are developing a new process of freeze-drying by the use of micro-waves. Although still in the experimental stage, it is hoped eventually that the process will make normally perishable foods available all year round in an unfrozen form, without loss of flavour or texture. The preserved food weighs only a fraction of the fresh product. When needed, it is restored to its original fresh condition within minutes by immersion in water. The food is then cooked in the normal way.

Sausages

It is estimated that the level of fresh sausage consumption in Britain is now in the region of £90 million annually. The Food Minister has declined to fix standards for meat content in sausage mixtures, on the grounds that any such standards would be unenforceable.

A boost to the protein value of sausages and other prepared foods was given with the introduction of a product containing 85% animal protein. This also shows excellent properties in the emulsification of sausage mixes, allowing the fat content to be increased, whilst cooking-out is reduced.

A new drying process to prevent discoloration of fresh sausages was introduced during the year. This makes use of hot air directed on to the sausage, sufficient time being allowed to dry the casing and underlying layer of meat. A deeper shade of red or brown results, enhancing the fresh appearance of the sausage.

Demand appears to be increasing for a uniform diameter sausage. An improved alginate-type casing was introduced early in the year, which maintains a uniform controlled diameter during filling.

Natural sausage casings, being of animal origin, are sensitive to light, and there is in production a new packaging material which renders sausage casings less liable to deterioration. This is substantially moistureproof and odourless. After packaging, with brine added as a preservative, it is rendered airtight and watertight by heat-sealing or tying, thus being convenient to handle, transport, or store. It will not deteriorate by the action of light.

Bacon

The use of an artificial sweetener for bacon, sodium cyclamate, has been permitted by the U.S. Meat Inspection Division provided that bacon so treated is marked. It is claimed that, by using sodium cyclamate in combination with salt and saltpetre, the bacon has cooking qualities superior to that flavoured with carbohydrate sweeteners.

MEAT IMPORTS

Argentina

The future of Britain's overseas supplies does not present a particularly optimistic picture. In Argentina, where cattle populations have been substantially reduced during recent years, from 47 million head in 1956 to 37·7 million (estimated) in 1959, domestic consumption in Argentina has increased from 176 lb. to 213 lb. per head since 1938, an increase of approximately 21%. This required 9 million head of cattle to be slaughtered annually to satisfy home demand. Slaughterings have exceeded calvings, and consequently a number of animals normally retained in the breeding herds have been slaughtered. This applies to bulls as well as females. Bull-beef is cured for export to the U.S.A., and the purchasers of bulls have been paying higher prices than that paid for choicest meat. Under more normal conditions, the number of bulls available for slaughter is very small compared with the true production of livestock, *i.e.* steers (heifers). Consequently the production of steers is declining because prices are not economic when compared to those obtained for bulls.

The Argentine Meat Board have announced that beef exports to Britain will be reduced by 40% in the first three months of 1959, and it has been estimated that by 1962 Argentina's exportable beef surplus will have fallen to 110,000 tons, well below half this year's shipments.

New Zealand

Britain imported less New Zealand meat. The percentages of sales by New Zealand to countries outside Britain continued to increase. From the start of the season (October 1, 1957 to June 28, 1958) shipments to markets other than Britain totalled 25·6% of exports. This compares with 11·8% in the previous season. The principal markets outside Britain are the U.S.A. and Canada. Meat was also shipped in substantial quantities to the West Indies, Greece, Japan, and Turkey.

New Zealand production of meat for export showed an increase of 0·5% over last season. The number of lambs slaughtered for export increased by 9·9%; because of an increase of nearly half a pound in the average weight of lambs, the total tonnage of lamb rose 11·4% to 220,747 tons.

There was a marked change in the pattern of beef marketing, less chilled beef being available for export, and production being down to 2,589 tons compared with 21,610 tons in 1957. Frozen quarter beef also showed a substantial reduction. On the other hand, the weight of bone-out beef rose 49·4%. The amount of chilled beef shipped to Britain was only 14% compared with a similar period last season.

During the season, the prices of New Zealand lamb and mutton showed a sharp reduction in the U.K., which is probably due in part to the decline in consumption over the past few years, and the competition of poultry, particularly broilers.

On June 23, the N.Z. Prime Minister, Mr. W. Nash, laid the foundation stone of the new Lorneville freezing works (Alliance Freezing Co. (Southland), Ltd.). The new works will be the first built in New Zealand since 1915. Plans for the works provide for the slaughter of 1 million head of livestock annually.

During the year, the liner *Mariposo* had her refrigerated space increased by 16,800 cubic feet to 44,800 cu. ft. Another vessel, *Monterey*, was to be similarly altered. The two liners will be used mainly for carrying New Zealand and Australian meat and other frozen products to America, and thus less will be available for export to the United Kingdom.

Prospects for the current New Zealand meat season appear to be good. Increased lambing percentages and excellent weather during the lambing season have given grounds for an estimate of an extra million lambs from the South Island and half a million

from the North Island. This may mean a total of 16 million lamb carcasses for export.

Meat has become New Zealand's principal earner of export income. In the first 9 months of 1958 receipts showed an increase of £7½ million over the same period in 1957. It is expected that the figure will reach £80 million for the full year. Sales of meat outside the United Kingdom reached 27½% of shipments to the end of September. Receipts from dollar areas totalled £60 million, five times greater than the 1957 dollar earnings.

Australia

Early in the year "chiller" grade beef specifications were announced. They were designed to meet the present United Kingdom consumer demand for young, light, and not excessively fat beef. The specification applies to ox and heifer meat, with a maximum chilled dressed weight of 700 lb. carcass. The carcass must show good fleshing quality and have a reasonably compact, blocky appearance, with hindquarter in general heavier than the corresponding forequarter.

With four new ships built specially to cater for the chilled beef trade, and capable of 17 knots, it is expected that the delivery time will be 28-30 days via the Torres Strait (Northern route), compared with 45 days for the Southern route. The "chilled" lockers are capable of taking 1,300 tons of meat.

Experimental shipments were carried out in the transporting of beef in nitrogen, the meat in metal containers being maintained in a refrigerated locker at a temperature of 29·5°F. and in a 100% nitrogen concentration. Favourable reports were received on the condition of the meat on arrival in London.

Drought in the Northern Territories gave rise to much concern, vast regions being converted into dust bowls completely bare of vegetation. It was estimated that cattle stations would lose 150,000 head of cattle, valued at £A3 million. Probably the ultimate loss will be even greater, for many of the cattle that perished were breeding stock needed to build up herds.

A feature of development in the Australian internal beef trade is the bringing down of young stock from the beef-raising areas to be sold in the shops as yearling beef; such carcasses command high prices.

Anglo-Australian agreement

In October, 1958, a new 15-year meat agreement with the United Kingdom was announced. New minimum prices were agreed and freedom given to Australia to exploit other markets for lamb and mutton. This is restricted, as far as beef is concerned, until after 1961.

POULTRY

Broilers

The "broiler" industry has probably made the most spectacular forward step in production over the past year. Annual production is estimated to exceed 30 millions and, at the present rate of growth, may well exceed 100 millions by 1961. This comparatively new trade specialises in producing birds of low fat content by intense methods of breeding and feeding, in which every phase of their processing, *i.e.* killing, dressing, and storage has been designed to ensure that they reach the consumer's table in the most perfect condition which human care and science can achieve.

Turkeys

The annual production of turkeys in the United Kingdom is at the 2 million level. Reasonable quantities are produced all the year round, but 85% approximately of the popular weight birds are still consumed at Christmas. Large plants have been erected to cater for the expected increased demand for oven-ready turkeys.

Cooking Sardines

(*Concluded from page* 196)

Requirements of a sardine cooking machine

It would be very desirable to transpose our laboratory experiments on to an industrial scale. It is desirable also that the general rules of cooking which we have just recapitulated should be applied in the critical examination of the various machines.

This work, which remains to be done, offers no difficulty especially if the machine involves the use of only one cooking medium: oil, hot air, or water vapour. A balance sensitive to half a gramme and several graduated cylinders are sufficient to determine the loss in weight on cooking and the quantity of exudate in the covering oil in the finished product. A certain number of trial productions spread over a fishing season would lead to standardisation of the machine in terms of the composition of the fish treated, and to the establishment, once and for all, of a cooking process similar to that which we have proposed for cooking in oil.

In the case of machines which employ successively two cooking fluids, it ought to be possible to distinguish the action of each of these phases, and this is why we ask the manufacturers to facilitate by appropriate means the taking of samples from different points along the line within the machine.

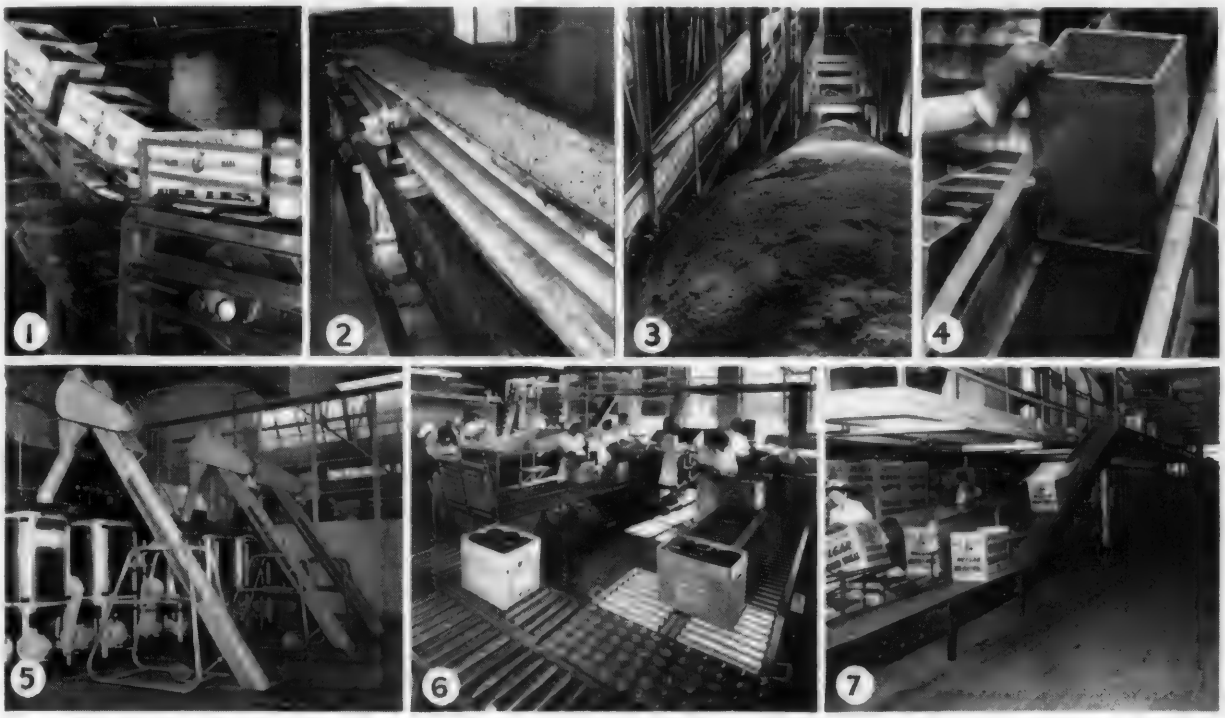
We are certain that the control thus exercised over the cooking of sardines could not fail to bring about an improvement in the quality of the finished product, which is the end desired by all canners.

Finally, we wish to thank the C.I.P.C. for having given us the opportunity of presenting the results of our laboratory work.

Mechanical Handling—

a FOOD MANUFACTURE survey

Have you a handling problem? This article may help you to solve it.



A selection of conveyor systems: (1) Beer bottle case lowerator delivering filled cases to loading platform; two strands of Renold 4 in. pitch 7,500 lb. breaking load chains are used with K2 attachments welded every outer plate one side. (2) A " U " belt conveyor made by Rownsons (Conveyors), Ltd., handling grain. (3) Raw sugar being taken to a silo on a Sandvik steel band conveyor; on the left can be seen the reclaiming conveyor. (4) BTR " Gripface " belting conveying empty tins for roof storage at the Friary factory of T. Wall and Sons (Ice Cream), Ltd. (5) Elevators by Conveyors (Readybuilt), Ltd., dealing with sugar at the C.W.S. aerated water plant. (6) A conveyor production system in the works of Bensons Confectionery, Ltd., planned by J. Collis and Sons, Ltd., showing sweets conveyed by the MotaVeyor in the background to chutes for cartoning; the cartons are being transported by gravity on the RolaVeyor and the TransVeyor. (7) A " Flowline " conveyor by Fisher and Ludlow, Ltd., carrying cartons at the Welwyn Garden City factory of Nabisco Foods, Ltd.

THE equipment to be described falls into the following categories: conveyors, lifting appliances, plant for handling materials in process, storage equipment, and motors and drives.

I. CONVEYORS

Pneumatic conveying

The advantages of pneumatic conveying over conventional man and mechanical handling are numerous, and this method of handling is particularly applicable to the food industry as it is safe and hygienic.

Henry Simon, Ltd., have introduced a new system of pneumatic conveying which they claim to be far superior to present conventional methods. After a period of prolonged and exhaustive testing, the Simon Sonic Conveying System, as this new patented development is called, is now being installed in plants in this country and overseas.

When materials are conveyed pneumatically between different parts of a plant, it has hitherto been necessary to provide a separate compressor for each blowing line. If several lines were powered from a single compressor, it was found that the air tended to take the path which offered the least resistance, and those lines which were heavily loaded were bypassed and became blocked.

To overcome this difficulty, the sonic valve, consisting of a convergent-divergent nozzle so proportioned that the air passing through reaches the speed of sound, has been developed.

It is based on a well-known thermodynamic principle: when the velocity of gas through a constriction is equal to the velocity of sound, the mass-flow remains constant irrespective of downstream resistance. With this valve interposed between a loaded line and the compressor, a pressure wave travelling towards the compressor as a result of a load change is halted at the valve throat, since the wave velocity of propagation is exactly equal to the opposing air velocity. In other words, the valve introduces a sound barrier between the compressor and the varying line resistance.

This system is said to be inherently more stable and versatile than those in which each line is powered by its own compressor. In the latter system the

air flow in the lines decreases with increased load, due to compressor characteristics, whereas the makers claim that the air flow through the Sonic Valve remains constant.

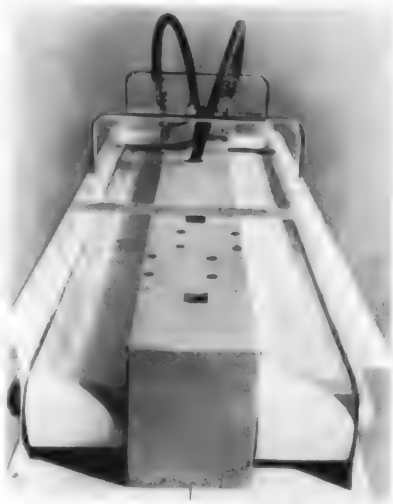
The valve, which is made of aluminium and is fitted with a pre-set load adjustment, is already in use at a Liverpool biscuit factory. Other systems incorporating the valve are in the course of erection.

Air Control Installations, Ltd., say that their systems are tailored to suit the requirements of the customer, and that most substances can be moved provided that they are not sticky on the outside.

It is usually desirable that reasonably straight duct runs are available from one point to another. The power required for this form of transportation is low, and because of the lack of moving parts other than the fan and motor, maintenance is slight. Four kinds of system are provided by this firm, pressure, suction, suction-pressure, and closed. To enable a scheme to be prepared, the following information should be supplied: nature and quantity of material to be handled; horizontal and vertical distance to be conveyed; sieve analysis and bulk density; and the temperature and moisture content of the material.

Mancuna Engineering, Ltd., provide the Mancuna-Dustex miniature cyclone for the high degree of air cleaning required by pneumatic handling plants; their D.450, an all-cast meehanite-iron abrasion resistant unit, is designed to meet the highest pressure conditions, and where food is concerned and powder recovery vital, the firm say that their M-40-A *Microclone*, an all-cast aluminium alloy miniature cyclone unit which can quickly and easily be opened up for thorough cleaning, is used extensively by food manufacturers in this country and in the U.S.A. An ancillary item now produced in this country is the Mancuna-Dustex vacuum valve, which requires no power and is inexpensive and simple in operation. It is an alternative to the rotary valve where bins, hoppers, or dust collecting equipment are under negative pressure.

The latest Simon sonic valve, with variable throat.



A small twin conveyor unit made by A. and C. Jenner, Ltd., fitted with pneumatically operated bag opening machines which automatically blow open the bags to receive an article. When the operator drops the article into the bag, its weight pulls it from the holding clip and it falls on to the conveyor.

Conveyor systems

Renold Chains, Ltd., have been manufacturing all-steel chains for mechanical handling for over 35 years. Their chains are based fundamentally on a high ratio of strength to weight, coupled with dimensional accuracy and careful choice of materials. Their conveying chains are suitable for bottle washing machines, box, crate, and barrel conveyors and elevators, all types of filling and packing equipment, etc. A wide range of attachments can be supplied, including spigot pins, stay bars, overhead trolleys, and the much-used bent-over or similar attachments integral with the chain plates, to which the customer's special fittings can readily be bolted or riveted. For overhead rail conveying, the use of biplanar links enable the chain to follow any desired path. For the feed and take-off sections of bottle and similar plant, the *Coventry* slat band chain provides a uniformly flat moving platform and is available in two ranges, one of stainless steel and the other of case-hardened mild steel, covering slat widths from 3 to 7·5 in. A further type of chain, the Mark 5, is a roller chain particularly suitable for slow speed conveyors and elevators operating in unfavourable conditions of damp and dirt. The standard range of conveyor chains goes up to 85,000 lb. breaking load, while special chains capable of handling loads far in excess of this are manufactured to order.

Sandvic Steel Band Conveyors, Ltd., manufacture a wide range of steel band conveyors for a variety of applications in the food industry. These conveyors are not affected by fats, oils, or grease, can withstand temperatures from −50 to 700°F., and are easily cleaned by washing down with hot water. They are of tubular construction and incorporate stainless steel bands with the new *Tru-Track* feature, which is a vee-belt bonded to the inside circumference of the band and operating over vee-rope sheaves instead of the more conventional pulleys. This, it is claimed, ensures perfect tracking of the band under all conditions regardless of any slight misalignment of the conveyor structure.

Rownsons (Conveyors), Ltd., have for many years specialised in bulk handling for the food industry, and manufacture bulk sugar plant, comprising intake conveyor elevators, and bulk storage hopper and sugar distribution conveyors. Their *Zipper* closed belt conveyor elevator provides a bulk handling medium where strict material control is necessary, and can convey and elevate in any direction. A single belt will operate in several planes and over a considerable distance; the belt, which is open during its return run, is automatically closed after filling, maintained closed during conveying, and automatically opened for discharge. Movable discharge units for multi-service points are available. The firm's "U" belt conveyor, an alternative to the troughed belt conveyor, is manufactured in pure rubber reinforced with canvas or nylon, and includes food and heat resistant grades. It is moulded in a "U" form with 3 in. sides and a width of 12 in., other widths being available to special requirements.

Recently, H. Brammer and Co., Ltd., have applied for a patent for a variable speed belt built up by means of links, giving a wide shallow belt resisting side pressure which at the same time is extremely flexible. It has in addition the advantages of vee-link belts in that it can be fitted to drives without the necessity of dismantling bearings or machinery parts, and can be stocked in coils and joined at will to make belts of any length. The belting is made of heat and oil resistant material, and is fitted with special steel plates which resist side pressure and may be easily attached to the belt.

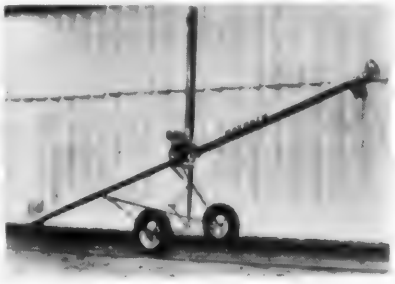
B.T.R. Industries, Ltd., manufacture a range of rubber conveyor belt-

ing covering many special applications including food, available in various grades including heat and oil resistant. White, drab, and black types belting are obtainable for dry foods, ice cream, fruit and vegetables, greasy foods such as margarine, and other kinds, as well as belting incorporating glass fibre, asbestos, and high tensile covers.

J. Collis and Sons, Ltd., manufacture a range of conveyor systems of original design; the *MotaVeyor* sectional design makes use of a continuous belt throughout the entire length of the installation, facilitates the carrying of small articles, and can be fitted with side tables, ploughs, remote controls, electronic counters, etc. Other techniques involve the *RolaVeyor*, the *TransVeyor*, and the *VertiVeyor*. The *RolaVeyor* makes use of gravity and can be used where the path of travel is straight or curved; it is made in both steel and light alloy sections which are readily portable, rustless, and easily cleaned. The *TransVeyor* table forms an omni-directional transfer point for transferring loads from one direction to another, and the *VertiVeyor* operates in a direct vertical line through the building, automatically loading and off-loading the goods at predetermined points.

The *Thorite* motorised conveyor driving drum made by Richards Structural Steel Co., Ltd., consists of an induction motor mounted inside a conveyor head drum which it drives by means of an epicyclic gear chain. On all but the smallest models, an anti-runback spray clutch can be fitted to the motor shaft. The drum is intended to run as a sealed unit.

Conveyors (Readybuilt), Ltd., specialise in a system known as *en masse* conveying in which bulk materials of a flaky, powdered, or granular nature are made to flow like a liquid through dust-tight conveyor and elevator lines by means of skeleton type chain links actuated by low power electric motors. The equipment is constructed of standardised components yet is said to have a considerable range of capacities, and is designed for maximum flexibility. Automatic mechanical handling systems are designed and manufactured to individual specifications, and the manufacture and installation of special *en masse* systems are also undertaken by an associate company, Redler Conveyors, Ltd.



The new Mayrath portable conveyor which consists of an Archimedes screw rotating inside a galvanised metal tube.

(*Left*): The Lansing Bagnall model FOER 3 rider electric truck stacking pallets of grain sacks. (*Right*): The Ransomes forklift truck stacking in cold store. This truck is fitted with hydraulically controlled clamps.

The *Mayrath* portable conveyor marketed by Gordon Felber and Co., Ltd., is available in five models for various materials in lengths from 11 to 41 ft., and can be driven by an electric or petrol motor.

The material handling equipment manufactured by Fisher and Ludlow, Ltd., includes both conveyors and pallets. The *Fisholow-Hapman en masse* conveyor system made by this firm consists essentially of a steel tube, which can be bent in any direction, through which is drawn a chain carrying circular flights. Other systems are the *Flowline* belt conveyor system built of standard parts which can be assembled for specialised purposes, consisting of five major units, drives, tensions, troughs, strands, and belts; the *Flowlink* universal chain conveyor system; and the *Flowroll* gravity conveyor system.

Conveying equipment manufactured by A. and C. Jenner, Ltd., falls mainly into two categories, horizontal and vertical, although there is a section which does both duties. The horizontal consists mainly of belt or slat conveyors, powered roller tracks, gravity track and skate wheel. The chain and slat conveyor is a straightforward unit for heavier duty work and for warehouse and loading bank operations. The belt conveyor is the simplest and most versatile type of conveyor used. Owing to its basic simplicity it can be constructed to carry a wide range of articles. This range has largely been made possible by the belt manufacturers, as now apart from the standard cotton belts there are a large number of special application belts, such as plastic coated, terylene, nylon, rubber, and rubber impregnated belts. The belts themselves on a conveyor can either run on a trough or rollers, depending upon the loading or the nature of it. For carrying loads above ambient temperatures the belt could be of wire, either woven or ladder type, in a variety of metals, stainless, monel, etc. It is common practice in the food industry to use conveyors built from stainless steel throughout. A common application in the food industry is cooling which may involve the use of cooling tunnels and frequently calls for conveyors to operate in a vertical zigzag pattern to give the longest possible cooling time in the smallest space. Belt conveyors generally can be provided in a variety of widths and can be constructed to go almost anywhere, *e.g.* round corners, over gangways, through tunnel bridges, etc., the cornering being achieved by use of a "power turn" which is a power driven taper roller track.

Vertical conveyors may be of the elevator, lift, spiral chute, and swing tray elevator type. Taking the elevator, the smallest of these can rise only 3 ft., possibly lifting articles from a process machine to a bin. The largest might run to the top of a four- or five-storey building carrying large pallets, possibly measuring 4 ft. cube. Small elevators can be made mobile and are very useful for such items as rice, loose sweets, and fruit, and are often used to feed bagging and weighing machines or pulpers and mixers.

Spiral chutes are an ideal way of bringing goods down a building as they occupy very little space, consume no power, and are practically maintenance free. They are particularly useful in the despatch department, where frequently goods are packed in cartons and will, therefore, travel very nicely down these chutes.

A. and C. Jenner also make a straightforward freight lift specially built to suit any particular requirement.

II. LIFTING APPLIANCES

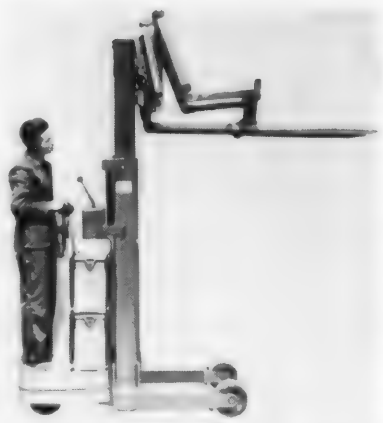
Fork lift trucks

The use of fork lift trucks in warehouses has enabled the quantity of stocks held to be doubled, and in some cases trebled, compared with the old storage methods. Now, fork trucks are available to stack pallet loads to any desired height. Lansing Bagnall, Ltd., make a range of trucks to suit various needs. In addition to the model FOEP 1, for conventional duties, the model FRES 2 reach truck can stack 40 × 40 in. pallets in gangways less than 6 ft. wide. It has a load capacity of 2,500 lb. and a telescopic mast unit giving 120 in. lift. The model FOER 3 rider electric truck undertakes handling in a fairly extensive warehouse where gangway space is not of prime importance and where speedy handling is essential. The pallet and stillage trucks models POEP 2 and SOEP 2, with carrying capacities of up to 4,500 lb., are readily adaptable for horizontal movement of goods for which fork trucks are not economic.

The range of equipment manufactured by G. Hunter (London), Ltd., embraces conveyors, industrial trucks, cranes, monorails, hoists, and lifting tackle. The industrial trucks include hand and electric operated hydraulic stackers of up to 1 ton capacity, and rider electric fork lift trucks of up to 2 tons capacity. Their conveyors include belt, slat, gravity roller, and overhead conveyors. A wide variety of hand and electric overhead travelling cranes are offered, and also overhead monorails of all capacities fitted with hand or power operated hoists. The oldest side of this firm's business deals with lifting tackle, which includes the *Exo* triple gear chain block and a multiplicity of chain and wire slings, jacks, winches, grabs, etc. Their latest invention, for which patents have been applied for, is the counter-balanced deck for loading lorries, with which a 15-ton lorry can, it is said, be loaded in 15 min. One of the most important of this firm's services is the testing of lifting appliances as required by the Factory Acts. All kinds of testing and repairs are carried out, and their outside staff inspect and test cranes on site at customers' premises.

Matling, Ltd., provide a range of powered trucks both rider and pedestrian controlled with capacities of up to 3,000 lb. and heights of lift up to 12 ft. An important feature is the compact interchangeable power unit, with a " deadman " clutch.

The extensive range of hydraulic lifting machines made by the Industrial Machine and Equipment Co.



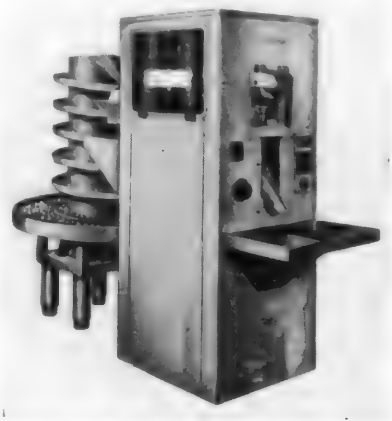
The Reach Type truck of 1 ton capacity with forks extended, made by G. Hunter (London), Ltd.

(Brimpex), Ltd., include the " Brimpex " self-actuating lifter models, 5 ft., 7 ft., and telescopic, as well as hydraulic stackers, barrel lifters, and interfloor lifts and lifters.

The range of products made by Felco Hoists, Ltd., includes chain blocks, overhead trolleys, hoists, slings, jacks, lifts, girder clamps, jib and overhead cranes, hydraulic lorry loaders, runways, etc.

Salisbury Precision Engineering, Ltd., makers of the *Sherpa* range of equipment, offer lift trucks, electric and hydraulic, of all sizes from 2 cwt. to 1 ton, stackers, stairclimbers, and a transportable hydraulic lifting table.

The range of electric trucks by Ransomes, Sims, and Jefferies, Ltd., is comprehensive, and include fork lift trucks from 1,000 to 5,000 lb. load capacity, platform trucks for loads from 1 to 4 tons, and tractors for loads up to 10 tons. The fork lift trucks can be equipped with special clamps,



The model S.1 automatic weighing and filling machine made by Valley Products (Lye), Ltd.

crane, or other attachments for handling any particular type of load. Side shift apparatus, which enables the whole load to be moved sideways once the truck is in position, can also be fitted. High free lift is another feature to enable a unit load to be stacked to a lift height of half the normal full load lift in places where headroom is limited.

Ranging in capacity from 5 to 45 tons, Coles self-propelled cranes are designed, manufactured, and marketed by Steels Engineering Products, Ltd. Comprising 21 different models, the entire range employs diesel-electric power transmission, which economises on the use of fuel. All Coles cranes incorporate many safety devices which protect load, machine, and operator.

III. MATERIALS IN PROCESS

Flour handling

Baker Perkins, Ltd., have always supplied a complete range of equipment for the bread baker, whose needs differ in several important ways from those of other manufacturers. Their schemes make provision for suitable storage facilities to fit into the varying size and often limited space of the typical British bakery. A sifter is installed to comply with modern standards of hygiene, and with the introduction of pneumatic conveying systems, aeration is possible to a higher degree than before, whereas previously this was one of the functions of the sifter. The method of weighing flour from bulk to mixer has been given much thought by this firm. Successful dough making depends on the accurate proportioning of ingredients of which flour is the chief; a patented bin discharge valve has been designed, and this is fitted on top of the weighing container, the best position for this vital component, since an instantaneous cut at this point prevents any over-run of flour. Supplementary features which can be readily included in this firm's systems are blending facilities and the introduction of bag flour; accuracy is maintained in conjunction with an improved design of silo fluidisation in which special attention has been given to the balancing of air dispersion against varying flour load resistances. The method of introducing bag flour allows for the continued operation of the accurate weighing system if in an emergency bulk supplies fail. It also permits the integration of bag and bulk systems when some of the flours are used in quantities insufficient to warrant delivery in bulk.

Vibratory feeders

Valley Products (Lye), Ltd., manufacture a range of handling equipment which includes spiral elevators in sizes up to a maximum discharge height of 10½ ft., feeders for the con-

Pneumatic handling systems (*left*): a Baker Perkins installation for feeding flour into dough bowls; (*right*): the M-40-A Microclone made by Mancuna Engineering, Ltd., for removing dust from pneumatic food handling installations.

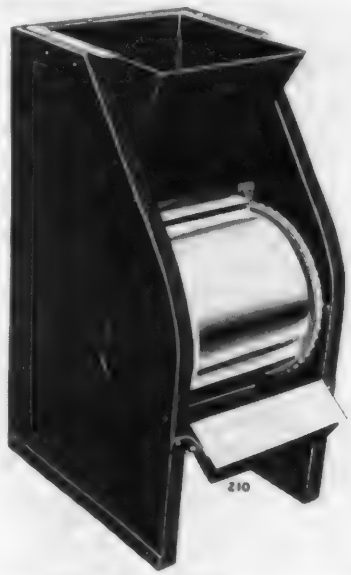
trolled feeding of almost any material from a bulk supply, bowl feeders for the single line feeding of small components to automatic machines, weighing and filling machines, as well as bin and hopper vibrators in various sizes. The Valco Model S.1 automatic weighing machine illustrated uses the vibratory spiral elevator for bulk feed and is designed to handle awkward commodities; at no stage in the movement of material is the flow actuated by mechanical means.

Automatic proportioning

The *Select-O-Weigh* system designed by Henry Simon, Ltd., is a system of automatic proportioning applicable where materials are mixed into batches of fixed or variable formula; the whole cycle of feeding, weighing, mixing, and discharging can be brought under the control of a central panel from which operations may be directed either by a single operator or by means of a punched card. It may be designed to fit an existing plant or, if desired, the project can be redesigned. Each panel is custom-built for a particular purpose and may include a number of safety devices to ensure that the operator can maintain a complete check on the progress of the weighings and will know at once if anything goes wrong.

Electromagnetic handling

The entire range of Magco equipment used for the food industry, made by the Magnetic Equipment Co., Ltd., is of the electro magnetic type. No lubrication, it is said, is needed, and no contamination of the finished product occurs. The range of equipment offered included very small feeders with a basic capacity of a quarter ton per hr. up to the largest used in heavy industry. In the food industry, units usually have a maximum capacity of a few tons per hr.; here the range includes floor mounted units, suspended units, tubular feeders, open feeders, and feeders having totally enclosed covers arranged for quick cleaning.



The Magco SSF magnetic separator made by the Magnetic Equipment Co., Ltd., incorporates a 14 in. magnetic drum to remove iron particles.

Special units can be provided where it is necessary to pay particular attention to the cleaning point.

Apart from the above the firm make a complete range of bin vibrators, ranging from units half a lb. in weight to 700 lb. The smaller units in the range are applied to hoppers and chutes to ensure that the material always flows in a satisfactory manner, irrespective of weather conditions. Their batch weighing equipment deals with up to eight lots of material discharged into a single hopper, the cycle being completely automatic. There are also units for weighing out quantities into containers, including automatic taring. In the field of blended products, the *Gravimetric* feeder delivers mixtures to a high level of accuracy. Fully automatic control is available.

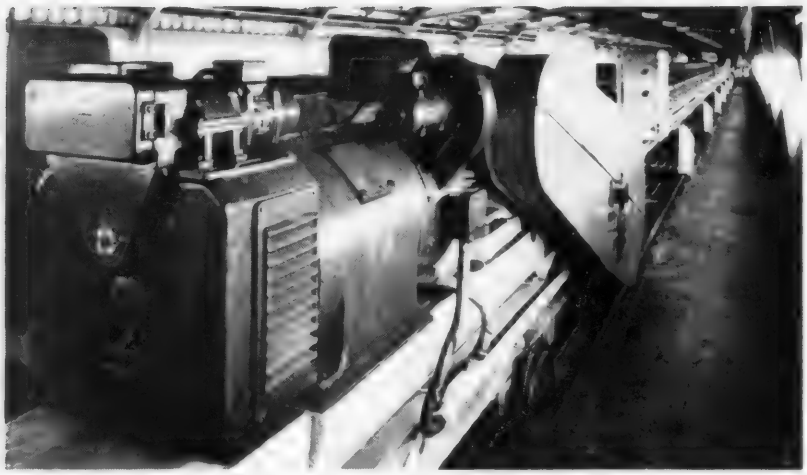
Magnetic separators are very important in connection with food handling, and a complete range of magnetic pulleys, drums, and chute magnets are made. Also manufactured are packing tables and vibrating screens.

The firm say that as this electro magnetic equipment is spring supported and tuned to be in resonance with the electric supply, the vibration is maintained by the springs and therefore the electrical power input into the equipment is very small.

IV. STORAGE EQUIPMENT

Pallets

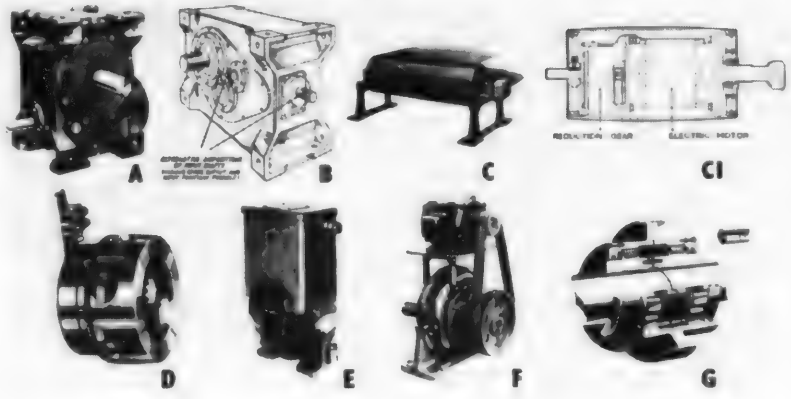
Flowstack pallets made by Fisher and Ludlow, Ltd., comprise a large variety of types and sizes, reversible and non-reversible, and 2, 4, and 8-



(*Left*): **British Thomson-Houston A.C. variable speed commutator motors driving reversible shuttle conveyors in a large sugar silo.** (*Below*): **Power transmission equipment made by Crofts (Engineers), Ltd.: A—Universal worm reduction gear unit; B—Universal helical gear unit; C, C1—"Ritespeed" motorised conveyor pulley; D—patented magnetic clutch; E—patented magnetic brake with built-in rectifier; F—"Unidaptor" reduction gear unit; G—"Croftring" flexible resilient coupling.**

way entry, the last type providing entry at the corners as well as at the sides. All pallets are stackable. The *Flowskip* tipping-box pallet can be picked up, transported, and discharged by one operator with a crane, and is designed for bulk and loose materials.

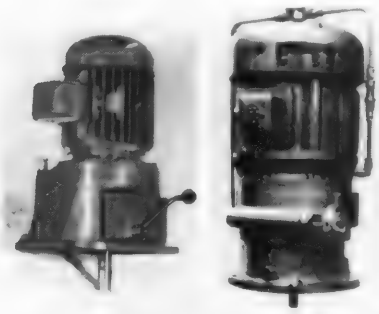
Metalcraft Products (Cardiff), Ltd., are consultants and manufacturers of materials handling and factory and storage equipment of all kinds, and say that each of their products is designed specifically for the purpose required. They say that as they do not manufacture a "standard" product, they bring a freshness of approach and a considerable degree of flexibility to each handling problem.



V. DRIVES AND MOTORS

Variable speed gear

Allspeeds, Ltd., have produced a modified version of the *Kopp Variator* variable speed gear, which has been specially designed for vertical mounting. Hitherto, due to the splash method of lubrication the standard model has only been suitable for mounting horizontally.



(*Left*): **Electropower Gears, Ltd., type ESRV geared motor can be offered with 2 or 3 speed gearbox in ranges from fractional to 75 h.p.** (*Right*): **Allspeeds, Ltd., have recently produced a modified version of the Kopp Variator variable speed gear designed for vertical mounting.**

The new unit is provided with a separate oil sump casting located on the lower flange of the gear. The need for seals on the lower shaft has been overcome, according to the makers, by incorporating a labyrinth and flinger arrangement which cannot deteriorate in service or allow any oil to leak down the shaft.

The oil is circulated from the sump into the upper bearings by means of a *Suddo* pump, which is mounted over and driven by the upper shaft of the electric motor. The working parts are claimed to be thus fully lubricated as the oil passes down through the unit back to the sump.

At the moment the size is limited to between ¼ and 5 h.p. with standard stepless speed variation over a 9 : 1 output speed range.

Electric drives

The British Thomson-Houston Co., Ltd., say that they have supplied a very large number of *Schrage* variable-speed motors for various food applications. This type of motor, with its infinitely fine speed adjustment and a shunt characteristic which enables it to maintain constant speed under widely fluctuating loads, can be operated by local or remote control and is particularly suitable for driving bread-making machinery. These motors are available with speed ranges from 3/1 to 12/1 at full speed rating from 1 h.p. upwards according to requirements.

Similar motors of higher h.p. are being increasingly employed for driving sugar handling and refining plant. The firm say that they have supplied a large number of 100 h.p. and 60 h.p vertical variable-speed A.C. commutator motors in the past few years to an important refinery. These machines also drive sugar centrifuges, and have been working successfully under adverse conditions for a number of years. B.T.H. have also supplied drive motors totalling 920 h.p. for the conveyor system of a recently commissioned raw sugar handling plant said to be the fastest installation of its type in the world. The motors can be controlled locally or remotely from a central control room. Safety devices are incorporated.

Crofts (Engineers), Ltd., say that the primary feature of their new Universal gear units is their adaptability to a wide variety of mounting positions, shaft dispositions, and ratios of speed reduction. Among other equip-

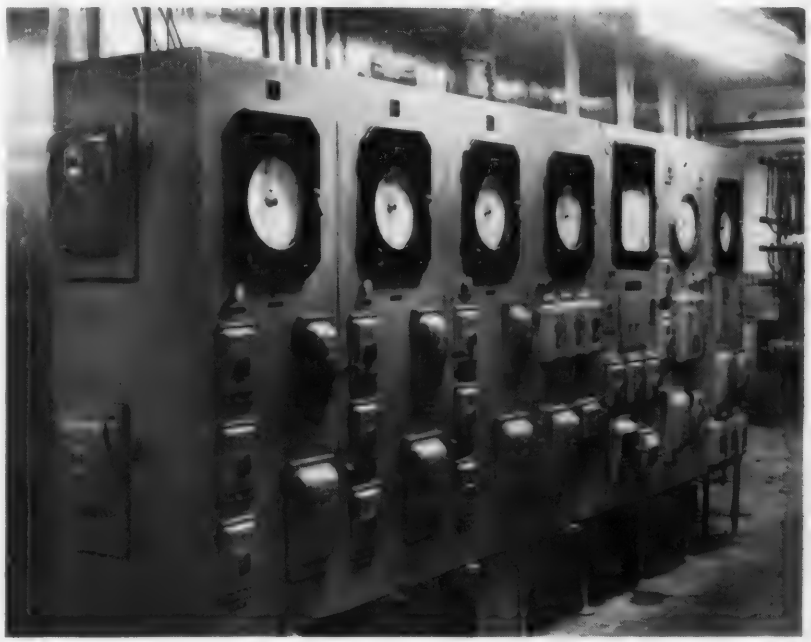
(*Continued on page 215*)

Automatic Smoking Kilns in New Canadian Factory

HYDROGRADE Food Products Inc. of Canada claim that their new Montreal factory is the largest and most modern of its kind in Canada. Sliced and smoked meat products, sausages, and salami are continuously produced at a rate of over 600,000 lb. per week on a floor area of some 60,000 sq. ft. Among the innovations in this plant are seven new-type smoking kilns with a total capacity of 35,000 lb. per charge; they are fabricated of polished stainless steel with walls insulated with fibre-glass. The kilns are fully automatic and are controlled by thermostats and humidistats.

The smoke generators are mounted above the kilns and burn hardwood shavings. Ducts and fans lead the smoke through filter screens to the smoking cabinets. In general design, the kilns appear to be similar to the Torry kilns described in FOOD MANUFACTURE, February, 1959, p. 54. Each kiln has eight cabinets and has two sets of stainless-steel double doors. Products to be smoked are loaded on trolleys which run on rails from the stuffing section to the kilns.

Automatic controls mounted on a centralised panel monitor the operation of the kilns and eliminate the guesswork which formerly decided the smoking process. Processing times vary with the product; Frankfurt sausages, for example, are completely smoked in about 1½ hr., while legs of lamb require about 8 hr.



(*Top*): The smoke generators are mounted on a mezzanine floor above the kilns, and are accessible by stairs and catwalk, leaving valuable floor space free. (*Centre*): The seven smoking kilns with a total capacity of 35,000 lb. showing the polished stainless steel cabinet doors. (*Bottom*): The centralised control panel which monitors the seven fully-automatic smoking kilns.

The sugar mill of Ingenio Barahona C. por A. at Barahona, which is one of the most recent to be built. Work on a $1½ million port to handle bulk shipments from the mill has been completed.

Sugar Production in the Dominican Republic

The country's economy has been placed on a sound footing by all-round expansion of the food industry; sugar remains the most important export.

DURING the last 28 years the sugar production of the Dominican Republic has more than doubled, from 365,000 tons in 1930 to 850,000 tons in 1957 and over a million tons in 1958. This is largely due to a planned reorganisation of the food industry carried out by the Trujillo government, which, besides streamlining the sugar industry and making the production units more economic, has also redressed the balance of an economy which hitherto relied too much on its sugar industry.

Britain has played an important part in the development of the sugar industry, supplying much of the machinery and remaining the Republic's best customer; in 1957, Britain took £21 million worth of raw sugar and molasses, or 37% of the total exports of the country.

The table gives the Republic's sugar production and export figures for the last seven years; price fluctuations affected the values of the yearly crops, but the production shows a steady increase.

Structure of industry reorganised

The basic structure of the present sugar industry was laid down in 1950, when it was seen that in order to produce high-quality sugar economically, the small processing units would have to be amalgamated and enlarged, and the plants modernised. A small number of large concerns were founded with exclusively Dominican capital, one of the objects being to reduce the proportion of foreign capital in the industry. Today, fifteen out of the Republic's sixteen mills are Dominican owned.

One of the largest concerns is the Azucarera Haina C. por A, which has the biggest cane crushing mill in the world, producing about 160,000 tons of sugar annually from 1½ million tons of cane. The company also acquired five mills and the plantations owned by the West India Sugar Corporation and the South Puerto Rico Sugar Company. Two more large concerns formed from amalgamations are the Azucarera Nacional and the Azucarera Yaque.

To co-ordinate the industry, a Sugar Board was set up in 1951. The board deals with technical problems regarding the growing of sugar and also represents the in-

Sugar cane being transported to the mill of Azucarera Haina C. por A. by the company's lorries and private railway. The mill is the largest in the world and handles 15,000 tons of cane every 24 hours.

dustry at international conferences; it has recently set up a number of research stations for developing new varieties of cane.

Modernisation of plants

Much of the new milling machinery is of British origin. One of the two tandem mills of Azucarera Haina was made by a Glasgow firm, who also supplied five of the evaporators and the refrigeration system for the 12 "U" type crystallising units. The factory is powered by three British-made turbo-generators, each of 3,000 KW. British switchgear equips the distribution panel.

At the Haina factory there are five warehouses for storing sugar with a total capacity of 550,000 200-lb. sacks. Syrup is stored in three tanks holding 5 million gallons. Serving the plant is a railway with 60 miles of track and a large fleet of lorries and trailers.

The West Indies Sugar Corporation's new mill at Boca Chica also uses British equipment, and a £320,000 turbine-driven cane mill tandem was recently supplied.

Sugar production over last seven years

Year	Production (metric tons)	Exports (metric tons)	Value of sugar and sugar products (£ million)
1951	532,841	481,854	66·2
1952	588,413	547,523	56·7
1953	605,629	553,479	44·6
1954	655,771	512,675	39·8
1955	625,651	579,441	44·8
1956	774,000	693,146	58·3
1957	850,000 (approx.)	766,524	78·6

Port facilities improved

To cater for the increasing demands of the industry, port facilities have been developed and are to be further improved. The port of Haina has been specially built to handle the output of the nearby refinery, and the port of Azua is still being extended. Following the raising of the export quota in August, 1956, the bulk sugar loading equipment was able to handle very rapidly an additional 200,000 tons.

This turbine-driven sugar mill tandem at the West Indies Sugar Corporation's mill at Boca Chica was supplied by the Derby firm of George Fletcher and Co. Ltd., and has an output of 90 tons of sugar cane per hour.

Uses for surplus sugar

As a precaution against the possibility of a decline in world demand for sugar, other uses for surplus sugar are being sought. The Republic's expanding cattle industry is making increasing use of green sugar cane for silage and of molasses for fodder, and is also exporting the former to the U.S.A. for the same purpose. The local chocolate and rum industries are taking increasing amounts.

The general expansion of the Republic's food industry has raised considerably the standard of living of the inhabitants, and imports have correspondingly increased. Second to sugar in the country's economy is coffee, followed by cocoa; the chief customer for both these products is the U.S.A. The production of rice has increased by 90% in 20 years, and meat processing is particularly successful, as a result of energetic government campaigns to improve stock and eliminate disease.

Advances in Food Technology

MEAT

Organoleptic Breakdown

Experiments are described in which comminuted fresh beef and pork were inoculated with spores of *Clostridium botulinum*, incubated, and examined for their putrefactive condition and the presence of toxin. The meat, which was vacuum packaged, was tested in three groups, viz., untreated, treated with ethylene oxide, and irradiated.

It was found that no single instance of toxicity was observed in a sample which could be considered edible. On the other hand, all samples showing putrefaction were not necessarily toxic. Further, in containers in which there was enough bacterial activity for the contents to be considered "off," no toxin could be detected. It is pointed out, however, that the results obtained do not constitute "absolute proof" that the toxin of *Clostridium botulinum* cannot occur in organoleptically sound fresh meat.—R. A. Greenberg, J. H. Silliker, W. K. Nank, and C. F. Schmidt, *Food Res.*, 1958, **23** (6), 656.

Muscle Tenderness

Studies have been made in an effort to find an objective method of measuring the tenderness in heated and raw meats which could be used to determine the carcase tenderness and which could be adapted to small biopsy samples. The press used was a modification of the *Carver* juice press. A pressure gauge measuring from 0 to 3,000 lb. in 25 lb. units was the most acceptable of the gauges available. Preliminary trials on representative homogenous materials indicated that the apparatus would give highly reproducible results.

The tests were carried out on three representative muscles from 57 beef cattle and one muscle of 36 other beef animals.

There were significant differences in the data obtained between muscles, but there were also significant correlations between the press and organoleptic scores and between the press and Warner-Bratzler shear. A significant correlation between the raw and cooked meat samples was also observed.

The tenderness was determined in raw *Longissimus dorsi* aged for up to three days and *Longissimus dorsi* aged for 10 days and then heated.

Continuance of the experiment with smaller scale apparatus for biopsy tests seemed feasible.—Doris D. Sperring, W. T. Platt and R. L. Hiner, *Food Technol.*, 1959, **13** (3), 155.

MEAT PRODUCTS

Green Discolouration in Meat

Green discolouration in fresh and salted meat products is due to two groups of bacteria: oxidising and sulphide forming. The enzymes produced by the micro-organisms affect the colour of the meat and form green pigments. This discolouration cannot be wholly avoided even if the bacteria are killed during boiling, as the enzymes previously formed remain active. The oxidising effect of the bacteria is due to thermo-unstable and thermostable R-O_2 enzymes, to sulphide forming aerobic or facultatively anaerobic bacteria, and to the formation of sulpho-myoglobin which, at optimum and maximum O_2 tension, is oxidised into a green pigment. The green stains are not toxic, but any discolouration is undesirable for general hygienic reasons.—B. R. Suri, *Die Fleischwirtschaft* 1959, **11**, 121.

Experiments With Vacuum Curing

The value of vacuum curing of meat products is still a matter of controversy. Research on this subject has been carried out at the German Federal Meat Research Institute, Kulmbach. With the dry curing of raw-to-eat products, the application of vacuum was not found to have any improving effect on the curing process. With large products destined for cooking, such as ham or ribs of pork, however, vacuum curing was found to bring about occasionally, but not necessarily, a slight improvement of flavour, juiciness and consistency, and some reduction of losses in cooking. Vacuum curing did not result in any acceleration of the colouring process or intensification of colour.—W. Gisske and G. Nitsch, *Die Fleischwirtschaft*, 1959, **11**, 189.

QUICK FREEZING

Ultrasonic Defrosting

Three representative frozen foods, hamburger, strawberries and liquid whole egg, were submitted to vibratory energy in an attempt to speed up the rate of thawing. The frequencies used were: 10 kc., 20 kc., 400 kc. and 1,000 kc.

The tests showed that thawed material was more absorptive than frozen material and excessive heating occurred in thawing out the hamburger. Micro-agitation caused by ultrasonic energy increased the rate of heat transfer and minimised the local heating in strawberries frozen in syrup. This streaming effect was very pronounced in liquid whole eggs, allowing for significant increases in the rate of thawing.

The high energy rates necessary for thawing frozen liquids and the negligible effects in thawing solid food indicated limitations in the use of ultrasonic energy. The poor absorption characteristics of food, the lack of practicable means to couple the energy to the food and the high cost of equipment together made ultrasonic defrosting an unfeasible proposition.—A. L. Brody and G. N. Antonevich, *Food Technol.*, 1959, **13** (2), 109.

PACKAGING

Use of Collapsible Tubes

At one time, the use of collapsible tubes of aluminium or tin was almost exclusively reserved for the packaging of pharmaceutical and cosmetic products. In recent years, however, collapsible tubes have come to be used on an ever-increasing scale for the packaging of foodstuffs of many varieties.

In France, the number of tubes used for foodstuff packaging increased from nearly 17 million in 1955 to over 28 million in 1956, and more recent statistics are expected to show even more considerable increases. Of the 28 million used in 1956, one-half contained condensed milk, 4½ million tomato ketchup, 6½ million mustard, over 1½ million mayonnaise, ½ million chestnut purée, ½ million sugared syrups, and the remainder spices and seasoned sauces. Not included in these statistics are certain foodstuffs such as anchovy butter, pastes, etc., for which tube packaging has already been in use for many years.

Prerequisite conditions for the use of collapsible tubes for foodstuff packaging include: sufficiently fluid texture, adequate microbiological stability, possibility of paying out in small portions, adequate sealing capacity of the tube. Stability is usually ensured by the contents of dry extract (sugar, lactose, etc.) or acidity, salts, or essential oils. The internal varnish must be perfectly resistant to the contents and must not affect their flavour. Heat processing associated with mass production of tube-packaged foods requires special care, and autoclaves are normally used for this purpose.

Certain precautions must also be taken for the transport and storage of the tubes, and a certain amount of consumer education is also required. The increasing popularity of tube-

packaged foods is partly due to the spreading of camping and tourism. Leading among the countries where tube-packaged foodstuffs have become popular are Switzerland, the Scandinavian countries, the United States, and Canada.—"*Revue Technique de l'Industrie Alimentaire*," No. 60, December, 1958, p. 69.

Water-Vapour Transfer Factors

The food packaging materials included in this study were: *Cellophane* (plain, 1.25 and 1.3 mil average thickness); *Cellophane* (polythene-coated, 1.50 mil average thickness); *Cellophane* (*Saran*-coated, 1.10 mil average thickness); *Saran* (1.25 mil average thickness); polythene (3.20 mil average thickness); *Pliofilm* (1.80 mil average thickness); and polystyrene (3.15 mil average thickness). Storage was at 25°C. and 50% r.h. in an air-conditioned room before the tests began.

The results of the water-vapour permeability tests carried out under various conditions of temperature and humidity appeared to support certain general conclusions.

Hydrophobic plastics, including *Saran*, polythene, and polystyrene showed a linear relationship between the water-vapour transfer rate and the partial pressure differential. Cellulose-based materials showed such variations in the results obtained that conditions of use data were thought to be more practicable. Between the temperatures of 20 and 57°C. there appeared to be theoretical relations for dependence of permeability which could be applied. At temperatures approaching the freezing of water, deviations from the ideal relations became considerable.

The study showed that there was still a need for investigation into the mechanism of water-vapour transfer at low temperatures and for further knowledge to be obtained of the relations between composition and permeability, especially for non-homogeneous materials.—M. Karel, B. E. Proctor, and G. Wiseman, *Food Technol.*, 1959, **13** (1), 69.

FREEZING TEMPERATURES

Effect on Vitamins

It is well known that foods remain well preserved at 0°F. for long periods. The authors have investigated the effects of storage of French style green beans, green peas, sliced strawberries, and orange juice concentrate, at 0°F. for periods of 2, 5, and 11 months and then at 20°F. for one month. For comparison, control samples were kept at 0°F. throughout.

The greatest effect was obtained on ascorbic acid. The green beans retained only 25% and the control only 50%. In the case of peas, ascorbic acid retention was 36%, the control showing no appreciable loss. Strawberries showed only a small loss, and the orange juice concentrate none. There was no consistent decrease in the content of other vitamins, although a variable decrease is indicated in folic acid, pantothenic acid, riboflavin, and Vitamin B_6.

It is suggested that there is a critical "break point," or critical temperature range, not far above 0°F., with adverse effects on colour and flavour coinciding with losses of ascorbic acid.—P. H. Derse and L. J. Teply, *Quick Frozen Foods*, 1958, **21** (4), 75.

BARLEY GRAIN

Drying Characteristics

The drying characteristics of barley grain have been investigated, for both shallow and deep beds (*Ld* 2-10 lb. B.D.S./sq. ft.), under different conditions of dry-bulb temperature, rate of air mass flow, wet-bulb depression, and of agitation.

The rate of drying of the shallow layers of grain depends largely on the dry-bulb temperature, the mass air-flow having a less marked effect, and wet-bulb depression having only a very slight effect. Mass air flow has a much greater influence on the drying rate in a deep bed.

Drying times between moisture content limits of 0.7 and 0.1 are used for correlation purposes, and a method for the prediction of the drying times of deep beds of grain are presented. The static pressure drops across beds of wet and dry material are also studied.—J. M. Hughes and T. J. Mitchell, *J. Sci. Food Agric.*, 1959, **10** (1), 39.

Writing a book?

The Leonard Hill Technical Group, publishers of FOOD MANUFACTURE invite the submission of manuscripts of books to be considered for publication. All manuscripts will be promptly acknowledged and carefully considered by qualified experts. A synopsis with chapter headings should be sent in the first instance to:

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CHEESE MAKING

Mechanised Process

In a mechanised process for making Cheddar-type cheese, three conventional steps are retained unchanged. These are the filling of the cheese vat with milk, inoculation with lactic starter and addition of rennet, and the cutting and cooking at standard temperatures. After the usual cooking for 30 min., the mixture of curd and whey is pumped to a rotating perforated cylinder so designed that the whey is drained off continuously. The curd passes to a compression chamber, where it remains, after applying pressure, for 2 hr., during which the acidity reaches 0.5%-0.6%, and the moisture content falls to 35%-40%. The curd is compressed, at about 1.8 p.s.i., into one large block which is automatically sliced and milled. The shredded curd is salted continuously to an average salt content of about 1.4%, which can be increased to as much as 1.7% if desired. Washing the curd with warm water sprays before salting is stated to improve the flavour.—A. V. Gemmill and H. Leber, *Food Engineering*, 1958, **30** (12), 65.

Mechanical Handling

(*Continued from page* 210)

ment made by this firm are the *Ritespeed* motorised conveyor pulley covering a variety of diameters and face widths in powers up to 30 h.p., magnetic clutches and brakes, reduction gears, and flexible couplings.

Electropower Gears, Ltd., say that they supply a range of geared motors and gearboxes from approximately 1/10 h.p. to 300 h.p. for driving all types of machinery, the most general use being for driving conveyors of all types. For mixing applications, vertical flange mounting units and special drives of the contra-rotating co-axial shaft type in which the shaft speeds may be the same or different, are supplied. Also made is a hollow shaft geared motor which can be fitted with a shaft whose height can be adjusted to the size of the container.

Hydraulic gears

Carter Gears, Ltd., manufacture a range of hydraulic variable speed gears capable of giving a 27/1 stepless variable speed range from input speed downwards, with the facility for picking up full load torque from zero r.p.m. They are for use in conjunction with British Standard motors and, if required, specially designed reduction units. Several alternative standard speed controls are available, and all sizes of Carter gears are readily usable with the many forms of proprietary pneumatic and other control systems used in the process industries.

Machinery and Equipment

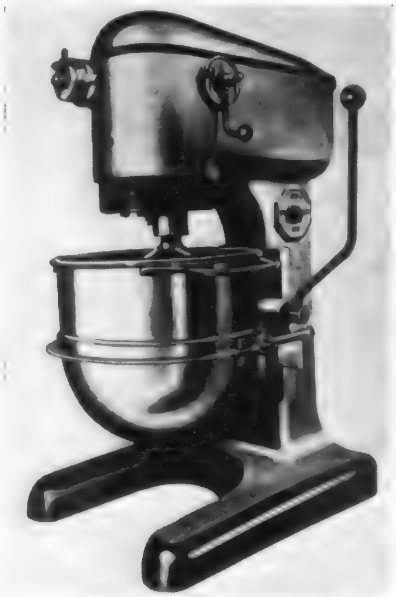
TEST OVEN

Simon Engineering say that excellent results have been obtained from the use of the new *Simon rotary test baking oven*. Tests have been carried out on a variety of baked goods, including various sizes and types of bread and up to 5 lb. rich fruit slab cake.

This new oven, the latest addition to the Henry Simon, Ltd., range of laboratory equipment, employs a rotary principle which is said to ensure identical baking conditions over a given series of tests. Within a stainless steel baking chamber, samples are rotated at a speed of 1 r.p.m. on four trays, each 13 in. by 11 in. in size.

Samples may be put into the oven at timed intervals, without any resulting drop in temperature, the heat being thermostatically controlled. The insulated door has heat-resisting glass panels, separated by an air-insulated cavity. When the door is opened, the turntable motor is automatically switched off. Water vapour can be introduced through a water trough in the base, connected with an internal reservoir.

The oven stands about 4 ft. high and weighs approximately 520 lb. The outer case is of welded steel, finished with stoved *Epoxy* resin over a rust-proof primer.



The Peerless and Ericsson Q20A food mixer has a ½ h.p. motor and a 3-speed gear.

STAINLESS-STEEL TAP

A new stainless steel tap was recently introduced by the Realm Engineering Works, Ltd. The tap, which has a stainless steel spring return shut-off feature, is available in two types, one of which has a stay open position.

The internal working parts are designed to prevent bacteria traps, and the whole tap can be easily dismantled for inspection without the use of special tools.

The action of the tap is described as positive yet smooth, giving non-drip service.

MIXING MACHINE

Among the mixing machines made by Peerless and Ericsson, Ltd., is the new *Peerless Q20A* mixer intended for use in medium-sized food factories or as an ancillary to large machines.

All the working parts in the machine are enclosed and the lubrication is fully automatic. Power is supplied by a ball-bearing fitted ½ h.p. motor with 3 speed, constant mesh, finger tip gear changing.

The machine is supplied with a beater, whisk and dough hook. Among the various attachments available for use with the machine are a meat mincer, vegetable slicer, grater, shredder, crumber, chipper, soup strainer and oil dropper.

The Kenwood Manufacturing Co. bought a controlling interest in the firm last September.

RECORDING EXTRUDER

An instrument called the *FIRA/NIRD* extruder has been devised by Mr. J. H. Prentice (of the National Institute for Research in Dairying), during research on the consistency of butter. It has been used for his investigations into the rheological properties of margarines (domestic, cake and pastry) and compound cooking fats, carried out on behalf of the British Food Manufacturing Industries Research Association at Leatherhead.

The instrument is used to force the material under examination through an orifice at a constant speed. During this operation the thrust required to extrude the material is continuously measured and recorded on a paper chart which then provides a permanent record of the behaviour of the material throughout the test.

The smoothness of this trace line is an indication of the smoothness of the material under test. In the case of butter or table margarine the final reading of the thrust is closely correlated with the "spreadability," as assessed by subjective tests. The area under the curve is a direct measure of the work done during extrusion.

The Simon rotary test baking oven is designed to give identical baking conditions over a series of tests. Samples are rotated at 1 r.p.m. on four trays.

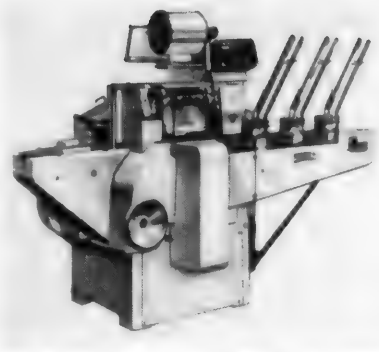
By means of a series of five interchangeable calibrated leaf springs, materials with a very wide range of textures can be examined.

The instrument has been found suitable for use with a wide variety of foodstuffs, in addition to the fats already mentioned, fondant, fondant icings, marzipan, jellies, piping jellies.

The commercial form of the machine has been developed in conjunction with H. A. Gordon and Co., Ltd.

MICRO-SWITCH

A new sub-miniature switch, half the size of the smallest switch previously available, was shown recently by Honeywell Controls, Ltd. Made to an entirely new design, the type *SX* subminiature reproduces the performance characteristics of larger micro-switches, while occupying 0·035 cu. in. of space. Dimensions are 0·5 in. by 0·35 in. by 0·2 in. and the switch weighs 1/28 oz. Contact action is single pole, double throw, and the switch can be wired normally open or normally closed. Available with plunger, roller or lever-type actuators, the switch will find applications, the makers claim, whenever space and weight saving are important.



This fully automatic biscuit wrapping machine made by Auto Wrappers turns out 60 packs of round biscuits per min.

VENTILATOR

One of the latest additions to the range of ventilation equipment made by Colt Ventilation, Ltd., was displayed recently at the Factory Equipment Exhibition.

The device, known as the *flap-opening S.R. ventilator*, is a natural extract ventilator which can be boosted to provide the additional air changes necessary in summer.

PATTY MACHINE

Details have been announced of a patty machine which produces patties at a rate of 40 to 80 per min. according to the rate of operation of the meat grinder to which it is attached.

The machine, the *Needham* patty machine, extrudes and ejects the patties on paper, as the meat is being ground. The extruding action of the machine is said to produce a patty which holds together in cooking and makes for juicy and light eating. The thickness of the patties may be adjusted from $\frac{1}{4}$ in. to $\frac{3}{4}$ in. by the turn of a screw, and the patties produced may be $3\frac{1}{2}$ in. sq. or rectangular, $3\frac{1}{2}$ in. by 3-5 in. The patties weigh from 2 to 8 oz.

The suppliers, Union Food Machinery and Equipment, Ltd., claim that this machine is easy to use and clean, since there is only one moving part in the machine, the guillotine which cuts the patties to size.

BODY FORMERS

F. J. Edwards, Ltd., have recently added a vertical irregular body former to the *Besco* range of machinery which they market.

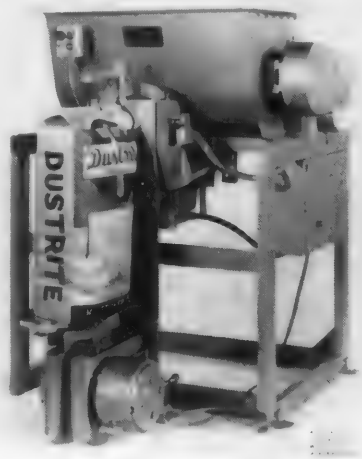
The firm say that the machine has a wide capacity range (2-14 in. diagonal by 16 in. deep) and forms bodies at a higher rate than the conventional horizontal machines. The feeding of the body blanks to the machine is easier and the removal of the formed bodies very much faster, according to the firm. The body former is fitted with a motor which has a speed variation of 20-100 r.p.m. enabling the speed to be adjusted for the size of body being rolled. The whole machine is fully guarded and motorised for 400 v, 3 phase, 50 cycles supply. It is supplied minus the forming mandrel and spindle.

For shipping purposes the gross weight is 8 cwt. and the size of the case 40 by 52 by 74 in.

BAG PACKER

A new bag packer of particular interest to flour, sugar, and other packers has been brought out by Stokers of California. Known as the *Stokes Settler*, it is claimed to have solved the problem of settling powder products effectively at the exact weight.

The makers say that this is obtained by rapid filling of the bag without the actual weighing being influenced by the "energy transmission" required to pack firmly.



A bag packer for flour, sugar and similar material made by Stokers of California.

According to the makers, the importance of the machine lies in the use of smaller containers than usual and so packaging costs are reduced.

The machine is an automatic $\frac{1}{4}$ h.p. motor-driven unit which is attached to a scale beam by two bolts. It can be adjusted to take sacks or containers of most sizes.

The settling is carried out by settler pads which impart pulsating blows. During the filling and settling process the bag is floating in the air. This balanced floating action results in the blows of the pads not being transmitted to the scales.

When different types of products are being packed by the same machine a different impact is required for each and a special timer and a delaying switch is used to control the energy of the impact.

The makers have announced that this machine is to be built in Great Britain under licence.

BISCUIT WRAPPING MACHINE

The latest addition to the Auto Wrappers range is a small-pack wrapping machine for round biscuits. Known as the *R. B. Model*, this machine is believed to be extremely simple in operation, needing only one operator (for feeding purposes). The makers claim that it is more compact than similar machines available.

The machine is fitted with a $\frac{1}{4}$ h.p. motor, giving an output of 60 packs per min. at 940 r.p.m. A special "no-pack, no-paper" safety device is incorporated, and optional extras include photo-electric registration of the printed wrapper design and provision for tear-strip insertion.

The machine will handle packs within the ranges of $1\frac{1}{2}$ to $2\frac{1}{2}$in. diameter and $1\frac{1}{2}$ to 3 in. in height.

The biscuits are placed into the magazine stackers by the operator and they are then automatically transferred into an intermittent pocket chain conveyor, the quantity of biscuits forming the finished pack being divided among the stackers. Thus, for a five-biscuit pack, two biscuits will be fed from each of two stackers and one from the third. During this feeding process, the biscuits are automatically placed on top of one another so that the completed pile is presented to the wrapping position.

The conveyor chain carries the piles of biscuits to a position where a plunger pushes the vertical piles into the wrapping material, which is automatically fed and cut to length from the reel, into a horizontal four-pocket wrapping head.

At the three succeeding stations of the wrapping head all folding and heat sealing is completed, and the wrapped packs are finally ejected on to an intermittently moving delivery mechanism, the direction of delivery being in the same direction as the feed.

The latest addition to the Colt range is this flap-opening S.R. ventilator.

The "Swingline" air tacker made by Strappings, Ltd., contains a belt of 3,000 pre-cut staple forming wires for several hours of continuous stapling.

AIR TACKER

A new air tacker, the *Swingline*, has been introduced by Strappings, Ltd., who say that the machine will give continuous stapling for hours.

The transparent plastic *Load-o-matic* magazine contains a continuous belt of over 3,000 pre-cut staple forming wires and the makers say this speeds up production by eliminating the time required to load repeatedly conventional tackers. Staples are despatched in non-returnable magazines.

The air tacker weighs 2 lb.

DE-RUSTING PISTOL

An air operated de-rusting pistol suitable for removing scale and rust from machinery and plant is made by John Trelawney, Ltd. The pistol, *Jasons Model 3B*, requires 12.5 cu. ft. of air per min. at 90 p.s.i. for operation.

The de-rusting pistol consists of a group of hardened steel needles, mounted in individual slots in a needle holder, propelled and retracted by a spring-loaded piston. The action is controlled by a trigger on the handle. Air flows continually over the working surface removing the loosened scale and dust.

The complete kit consists of a pistol together with 65 × 2 mm. flat end needles or 28 × 3 mm. chisel end and pointed needles. Two interchangeable mouthpieces are provided, one straight and one round. A chisel holder and three different types of chisel are included together wth spare needles and 30 ft. of $\frac{3}{8}$ in. air hose.

PNEUMATIC SLIDE

A pneumatically operated slide suitable for fitting to the outlets of bins, conveyors, mixers, etc., has been produced by W. S. Barron and Son, Ltd. It may be remotely controlled from any distant point by means of electrically or manually operated valves. Fully open, fully closed, and intermediate points may be employed. It can be fitted so that it has an inching or reciprocating action to act as a feeder prior to a weigher. Electrical contacts can be incorporated so that the open or closed position of the slide can be indicated on a control panel.

Operation can be obtained automatically from a control panel in a given sequence with the minimum of inconvenience to an operator. Runner bars are provided to avoid build up of material, and the slide can be totally enclosed where desired.

The slide is available in a number of standard sizes between 6 in., and 14 in. square, and can also be modified by the makers to suit specific size requirements.

CODING MACHINE

A recent addition to the range of printing units made by Sauven Perforating Machine Co., Ltd., is the *Codareel* printing unit, intended for mounting on any automatic reel-fed automatic packaging machine.

Using this machine, a code date or other information is imprinted at regular intervals on the wrapping materials as they unwind. The makers say that special inks are available to ensure the quality of the print on any material, including cellulose film and waxed papers.

The type drum is of 18 in. periphery and several sets of type may be inserted to allow printing at whatever intervals are desired. The type used is rubber *Baselock*, available in any size and claimed to be quickly interchangeable.

The "Mobility" tubular steel trolley introduced by F. Piper and Sons, Ltd., for moving small parts.

TROLLEY

F. Piper and Sons, Ltd., have taken over the goodwill and manufacturing rights of the *Mobility* range of tubular steel type trucks, trolleys; wheels and castors.

The firm has introduced a new trolley in this range which they say is suitable for handling small parts both in production and packing which call for an easily moved and accessible type of unit.

The chassis is made in $1\frac{1}{4}$ in. diameter steel tube. Its overall length is 36 in., width 24 in. and height 36 in. It is fitted with two 6 in. roller bearing wheels on a 1 in. axle and two 6 in. ball bearing castors.

The removable trays which are made of deal, have an inside measurement of 34 in. length by 20 in. wide by $1\frac{1}{4}$ in. deep. The distance between trays is 20 in. and it will carry a maximum load of 100 lb.

FLOOR MAINTENANCE MACHINE

The G.F.S.M. Co., Ltd., claim that they have perfected an industrial all-purpose floor maintenance machine, available in two models, which is capable of sanding, scurfing, scrubbing, waxing and polishing.

This machine, the *Turmix*, is single-hand in operation, and the makers maintain that it is completely non-splash, and the only industrial machine capable of cleaning right up to the wall and into the corners.

All operational elements can be changed in seconds, sanding and scurfing can be done with ease by unskilled labour.

Unlike the orthodox cleaners with the circular or cylindrical brushes that spin, the *Turmix* utilises a slender rectangular element which moves in an elliptical rotation of 3,000 revolutions per min. This high speed reproduction of the normal hand movement eliminates the centrifugal force.

LIFT TRUCKS

Hyster, Co., have announced the *Challenger 360 and 400*—the latest additions to the line of pneumatic tyre lift trucks. The units are rated at 36,000 and 40,000 lb. capacity at a 36 in. load centre.

Power is supplied by a 6 cylinder Continental engine, which develops 153 h.p. at 2,400 r.p.m., 350 lb. feet of torque. Standard equipment includes: pressure lubrication of rods and bearings; individual valve portings; a mechanically driven fuel pump; and a built-in oil filter and cooler. Continental diesel engines are available as optional equipment.

This Hyster Challenger lift truck has a capacity of nearly 20 tons.

News Digest

Fisons milk plant for Northern Ireland

A new milk processing plant using 5 million gal. of milk a year is to be set up at Coleraine, Northern Ireland, by Fisons Milk Products, Ltd.

Fisons have decided to transfer the manufacture of *Sanatogen* nerve tonic from Loughborough, England, to Coleraine, where the new plant will cover 20,000 sq. ft.

The transfer of the plant will be undertaken during the year in two stages.

Full production at Loughborough will continue until the end of July, then half the plant will be shut down and transferred to Coleraine. It is anticipated that by the end of the year the transfer will be complete and that in March, 1960, the plant will be in full production. About 50 additional people will be required, of whom at least half will be men.

Mr. P. S. Needham, managing director of Genatosan, Ltd., explained that *Sanatogen* manufacture was being transferred to Northern Ireland because supplies of milk in the Loughborough area are not sufficient to meet the present demand for the product. He said that 5 million gal. of liquid milk were needed every year to manufacture *Sanatogen*, and the firm expects to obtain this quantity at Coleraine.

Mr. Needham also said that Coleraine had been selected as a site for the future development of products based on milk.

Transfer of D.S.I.R. Stations

Three D.S.I.R. Stations—all concerned with the preservation, storage, handling or protection of foodstuffs—will be transferred to the Agricultural Research Council on July 1. They are the Ditton Laboratory at Larkfield, Kent, the Low Temperature Research Station at Cambridge, and the Pest Infestation Laboratory at Slough.

The agreement between the Council for Scientific and Industrial Research and the Agricultural Research Council—which has received the approval of the Lord President of the Council (Lord Hailsham)—was made because the two councils believe that it is in the national interest to bring all Government research on food other than fish under one body. The aim is to make the research more effective.

Standards for ice cream

As from April 27, 1959, new regulations relating to ice cream, based on recommendations of the Food Standards Committee, came into operation in England and Wales. The main changes made by the regulations are:

(a) that standards are to be fixed for dairy ice cream and for milk ice which are required to contain milk fat and must not contain any other fat;

(b) that saccharin and other artificial sweeteners are not to be used in any ice cream or in milk ice, and no minimum sugar content is laid down;

(c) that ice cream made with non-milk fat is not to be labelled or advertised in a way which is suggestive of butter, cream or milk; but such ice cream may continue to be sold as "ice cream" and it may bear a statement that it contains skimmed milk solids;

(d) that after November 30, 1959, all pre-packed ice cream which is made with non-milk fat must be labelled that it contains vegetable or non-milk fat if it is sold as "ice cream."

The present requirements that ice cream must contain not less than 5% fat and not less than 7½% milk-solids-not-fat are included in the new regulations and so continue in force. The new regulations will revoke and replace the existing Food Standards (Ice Cream) Order, 1953.

Wall's new Scottish cold store

The new cold store built by Smiths Insulations, Ltd., for T. Wall and Sons (Ice Cream), Ltd., at Craigmillar, Edinburgh, was completed in record time. Construction work began in the first week of December, 1958, and the prefabrication of all the structural units ensured quick assembly on site.

The building, measuring 172 ft. long × 114 ft span × approximately 27 ft. to the eaves, consists of a steel framework erected on concrete foundations and specially designed to support the cold store ceiling, spanning the full width of the building without any intermediate supports. This steelwork encloses both the cold store itself and all surrounding rooms and is arranged with an intermediate floor round the outside of the cold store section which carries the air cooling chambers.

Food in Parliament

M.P.s learned recently about investigations in food packaging from the Parliamentary Secretary to the Ministry of Works, Mr. Harmar Nicholls. At the laboratories of the Printing, Packaging and Allied Trades Research Association work is being carried out on methods of protecting food against the hazards of transport and climate. In reply to a question about standardisation of packets and designs of cartons, Mr. Nicholls explained that it was under both of these heads that much of the research was being done.

At the Torry Research Station and the Low Temperature Research Station at Cambridge, research into the problem of rancidity and deterioration in fats and oils is being carried out, it was reported.

The effect of irradiating food as a preservative method has also been studied by the three laboratories of the D.S.I.R. which are concerned with food, where the main object of research has been the effects of irradiation on the keeping qualities, flavour, appearance and texture of fish, meats (especially chicken) and potatoes.

The Atomic Energy Authority is also observing the long-term results of feeding animals with foodstuffs preserved in this way, and so far no harmful effects have been noted.

Seven women's organisations were consulted by the Board of Trade on the shape of the proposed new regulations to extend the Food and Drugs Acts and the Sale of Food (Weights and Measures) Act, it was disclosed.

Four of these bodies agreed to the department's proposals, and the other three suggested additions. The suggestions included: that biscuits should be sold only in certain specified weights; that packeted sweets and chocolates weighing 2 to 3 oz. should be marked with their weight as well as those over 3 oz., and also that boxes containing collections of packets of sweets and chocolates should be marked; that cake mixtures of various kinds and custard and blancmange powders should only be sold in specified weights; that pre-packed large cakes and pieces of cake should be marked with their weight; that all bread, including fancy and sliced bread, should be sold by net weight only; and that shortbread or oatcakes should not be exempted from the marking requirements.

Mr. John Rodgers, Board of Trade Parliamentary Secretary, promised that all the suggestions would be looked at.

PEOPLE

MR. J. SCHWARTZ has been appointed manager of the new plastics film division formed by British Cellophane, Ltd., for the manufacture and marketing of films other than *Cellophane*. He has been with the company since its formation in 1935 and was recently sales service manager. MR. D. NOBLE is production manager and MR. D. F. H. DREW is sales manager.

■

MR. R. W. HONEYWELL has been appointed representative for the Leicester area by Crofts (Engineers), Ltd. An apprentice-trained and qualified engineer, he has recently completed a four months' training course at their Bradford works.

■

MR. R. L. FENWICK has been appointed field manager for the United Kingdom by Quickfit and Quartz, Ltd. He was previously area sales representative for the north of England, Scotland and Ireland.

■

MR. W. C. DIVER, who has been Wall's multiple sales manager for the past four years, continues to be manager of the multiple sales side of the meat division.

■

MONSIEUR E. J. SOLVAY has been appointed president of the Society of Chemical Industry by the council to succeed Sir Robert Robertson, O.M., F.R.S., upon the completion of his term of office. M. Solvay is a direct descendant of the discoverer of the ammonia soda process which bears his name.

*

MR. S. R. BADLEY has been appointed market development manager, Distillers Plastics Group. He was formerly sales manager in charge of binder resins for British Resin Products, Ltd., and this appointment will now be taken over by MR. C. D. HARVEY-PIPER.

MR. L. R. ANTHONY has been appointed information officer and A. E. OATES publicity officer for the Distillers Plastics Group.

MR. J. D. WINSTON has been appointed general sales manager, British Resin Products, Ltd., and is now responsible for the sales of all the plastics materials produced or marketed by B.R.P. MR. G. E. H. SMOCK, who was previously assistant sales manager in charge of *Rigidex* polyethylene, has been made sales manager for this material.

MR. R. J. FACER has been appointed general sales manager of British Geon, Ltd. J. E. Richardson takes over as export manager from S. A. Williams, who becomes administration manager (sales). G. Y. Blomeley has been appointed northern manager.

Mr. P. Boulton

Mr. R. W. Honeywell

Mr. J. Schwartz

Mr. A. Sanderson

MR. ALAN SANDERSON, A.M.I.MECH.E., A.M.I.GAS.E., has been appointed sales manager of the Blaw Knox Chemical Engineering Co., Ltd.

■

MR. PETER BOULTON has been appointed general manager of Lansing Bagnall, Ltd. He was formerly managing director of Brades, Nash and Tyzack Industries, Ltd. He will also control the management of J. E. Shay, Ltd.

■

MR. STANLEY V. SWASH, a former chairman of F. W. Woolworth and Co., has been appointed a director of Mellin's Food.

■

MR. P. W. UNDERHILL, chief shipping officer of Birlec, Ltd., has been appointed chairman of the West Midlands Branch of the Institute of Export.

■

MR. T. F. COOPER, who has been bakery supervisor of the retail branches of the Scottish Co-operative Wholesale Society since 1946, has been appointed to the new position of assistant general manager of the United Co-operative Baking Society, Glasgow. He was previously bakery manager of the Cowdenbeath Co-operative Society.

*

MR. REGINALD T. TIPLADY has joined the board of the District Supply Aerated Water Co. and its subsidiary Daws Fruit Cordials. He has been appointed chairman and managing director of both companies.

MR. LEONARD LEVEK and MR. JOHN A. ELLERT have resigned from the boards of both companies.

■

MR. D. A. R. KNIGHT recently retired from the managing directorship of the Eastern Area of United Dairies (London), Ltd., which he has occupied since 1942. A director of United Dairies, Ltd., since 1948, he joined the company in 1928 when the family milk retail business of John Knight and Sons in Stepney was absorbed into the Group. Mr. Knight devoted much time and energy throughout his career to staff welfare. He is a past president of the National Dairymen's Benevolent Institution.

MR. T. D. CRAVEN and MR. E. ALAN WILLIAMS have been appointed to the board of Hovis.

*

MR. V. W. G. WRIGHT, trader promotions manager of Wall's meat division, has been appointed to the newly created post of multiple sales manager of the company's Handy Foods division.

*

SIR JAMES TURNER (president of the National Farmers' Union) and MR. W. R. TREHANE (chairman of the Milk Marketing Board) have been appointed vice-presidents of the British Dairy Farmers' Association.

■

MR. HUGH JOSEPH of J. Lyons and Co., Ltd., has been co-opted on to the council of the British Baking Industries Research Association to fill the vacancy caused by the death of his father.

■

Nutrex, Ltd., have appointed MR. F. K. CATLOW as sales representative for Lancs., Ches., Barrow Peninsular and Cumberland and Westmorland, and MR. ALAN HALE as sales representative for Northumberland, Durham and the Tees-side area as far south as Saltburn.

■

MR. E. HALL, marketing director of Birds Eye Foods since 1956, has been appointed co-ordinating director. He will be responsible for co-ordinating developments resulting from the broadening of the company's activities.

MR. K. J. B. WEBB, general sales manager since 1954, will succeed Mr. Hall as marketing director.

*

MR. STANLEY J. MORRIS, formerly general works manager at Castleford, has been appointed general manager of the Charlton glass container works of United Glass, Ltd. He joined United Glass Bottle Manufacturers, Ltd., in 1948.

*

MR. S. W. PEARSON has been appointed general manager at John Lumb and Co., the Castleford subsidiary of United Glass, Ltd., in succession to Mr. S. J. Morris.

OBITER DICTA

● In an American Restaurant: "Eat here and keep your wife for a pet."—*Letter in Sunday Times.*

● It has been found that bananas have valuable properties as face packs for women.—*Commonwealth Producer.*

● Can nothing be done to stop the wholesale massacre of innocent French cheeses which is taking place at our "help yourself" stores?—*Letter in Sunday Times.*

● Ham and bacon can be packed for picnics and lunch baskets with every confidence that they will not "go off" if the weather happens to take a turn for the better.—*Press Release.*

● It may be wise (I do not know) to insist that the tourist should eat his *pâté de foie gras* in Piccadilly rather than in Parigeux, where they make it.—*Letter in Daily Telegraph.*

● There is more milk being sold now for drinking purposes than there is beer. The brewers are on the run.—*Lt.-Col. Valdar Gates, one of the International Dairy Congress Organisers.*

● Mr. Krushchev condemned the practice of compulsory "mass purchase of cows" which had developed, and told his listeners that "peasants must be persuaded to realise that it is not profitable to have their own cows."—*Manchester Guardian.*

● I am surprised at the suggestion that "the average Englishman knows the contents of Irish stew." More often than not it has carrots, barley and even dumplings, and not nearly enough onion. This may be quite a good and satisfying dish but it is *not* Irish stew.—*Letter in Daily Telegraph.*

● Another Tory, Mr. Kershaw, put the contrary and unfamiliar view that modern vitamin-feeding is bringing children to an earlier puberty and therefore, he thought probable, to an earlier death. Well, as Shallow might have said, we shall either live shorter or longer. Nobody at any rate would disagree with the Conservatives who say that ageing is a continuous process.—*Manchester Guardian.*

Emergency Call

An urgent 4,500 mile telephone call from the General Manager of Kenya Co-operative Creameries to the A.P.V. Co., resulted in the despatch by air to Nairobi recently of the two 3,000 gal. per hr. APV Paraflow *milk coolers seen here being loaded on to a Hunting Clan D.C.6 at London Airport. The telephone call told of a crisis due to an unexpected temperature rise with a danger of milk being lost through souring. The coolers had been completed for one of the ice cream factories of T. Wall and Son, Ltd., who generously released them.*

Management exchange

As a result of an arrangement which has been reached between the Polish meat exporters' representatives in the U.K., Anglo-Dal, Ltd., and Bowyers (Wiltshire Bacon), Ltd., there is to be an exchange of young managers between Bowyers and a Polish bacon and canned meat factory.

Under the arrangement, Mr. J. L. Rogers, Bowyers' assistant factory manager, visited Poland as a guest of the Polish Meat Industry, which arranged his itinerary.

Stainless steel mill

Work has started on a £1 million scheme to modernise and expand the stainless and alloy steel sheet rolling plant at Samuel Fox and Co., Ltd., Stocksbridge, a subsidiary of the United Steel Companies, Ltd.

When the scheme is completed, Samuel Fox will be able to supply stainless and alloy steel sheets up to 30 ft. long, 6 ft. wide and ¾ in. thick, with a maximum weight of about 3,000 lb.

U.K. selling rights

The Incandescent Heat Co., Ltd., who have manufactured process equipment to the designs of the Swenson Evaporator Co. (a division of the Whiting Corporation) of Harvey, Illinois, for some years, have now concluded an agreement under which they have exclusive selling and manufacturing rights in the United Kingdom for all Swenson products. The firm has formed a chemical plant division, headed by Mr. C. J. V. Denning.

New products

Coinciding with the opening of their new factory at Lifton, Devonshire, on April 10 the directors of Ambrosia, Ltd., have announced two new products: creamed semolina and creamed barley.

Glass-lined vessels

Details of their new range of acid-resistant glass-lined steel equipment for use in the chemical and pharmaceutical industries are announced by QVF, Ltd.

The equipment includes open vessels, evaporating pans, open and closed jacketed tanks, receivers, an extensive range of reaction kettles; storage tanks, heat exchangers and stuffing boxes.

QVF are acting as agents for the Schwelmer Eisenwerk (Muller and Co.) of Schwelm, Westphalia.

Margarine industry meeting

The International Federation of Margarine Associations (I.F.M.A.), which was established last year, held its second a.g.m. in Lugano in Switzerland on April 8 and 9. In this conference, delegates from the margarine industry in Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom participated, while representatives of the margarine industry in Finland, Portugal, Spain and the United States attended the meeting as observers.

During this meeting lectures were given on new developments in oil refineries, on the development of the consumption of different fats, and on the importance of margarine production and consumption to countries producing raw materials for margarine.

Bursary scheme

In order to encourage technical education within the chocolate and sugar confectionery manufacturing industry, the W. G. Speat Educational Trust has instituted an annual bursary to the value of £100, the successful candidate to complete the two-year full-time course at the London Borough Polytechnic. Particulars and application forms may be obtained from: B. D. Cassie, Esq., Chairman of Trustees, Specialised Publications, Ltd., Berwyn, St. Mary's Road, Ditton Hill, Surbiton, Surrey.

Lecithin agents

Archer-Daniels-Midland Co., New York, said to be the largest producers of soya oil in the U.S., have appointed Fatoils, Ltd., as their sole selling agents for lecithin which they produce in plastic and fluid, bleached and unbleached uniform grades.

Polish agents

McCall and Co., Ltd., sole distributors in this country of Polish canned poultry for over two years, have now been appointed sole distributors of Polish canned game.

The first available variety is canned whole partridge, prepared from selected young hen partridges which have been roasted in butter with the addition of mushrooms (champignons).

All books reviewed in FOOD MANUFACTURE as well as any other scientific or technical book may be obtained from:
Technical Books
308, Euston Road
London, N.W.1.
Tel: Euston 5911.
Prompt attention is given to all orders.

FORTHCOMING EVENTS

Society of Chemical Industry

Food Group

May 13. Young members meeting. Short papers. 6.15 p.m., 14, Belgrave Square, London, S.W.1.

May 27. Annual general meeting. Chairman's address by Prof. J. R. Nicholls. 6.15 p.m., 14, Belgrave Square, London, S.W.1.

Australian subsidiary

British Sidac, Ltd., have formed a subsidiary company in Australia. This company will be known as Sidac (Australia) Pty., Ltd., with offices at M.L.C. Building, Victoria Cross, North Sydney, Australia, and will act as agents and distributors for the parent company.

Sausage prices cut

T. Walls and Sons (Meat and Handy Foods), Ltd., have cut the prices of their pork sausages by 2d. per lb.

A spokesman said that this reduction was due to the reduction in pig prices.

Wall's "eight-to-the-pound" pork sausages will now sell at 2s. 9d. per lb., pork chipolatas at 3s. 6d. per lb. and pork skinless sausages at 3s. per pack of 16."

Canning lines for Russia

Mather and Platt, Ltd., announced recently that they were expecting confirmation in the immediate future of an order from Russia for two fully automatic sardine canning lines costing about £220,000. The canning lines may be used to can other products and are also designed to make use of various shaped cans.

It was also stated that the Russians were contemplating the purchase of four canning lines in all from the firm. A spokesman for the firm said that a future order may include a can-making plant.

Sales offices

Adams Powel Equipment, Ltd., have formed a home sales department at their factory in Gateshead, Co. Durham.

Mr. Raymond Davies, formerly Sales and Commercial Director with K. X. Lamps, Ltd., has been appointed home sales manager. This new department will have a sales force which, while maintaining a close contact with users of *Adams Powel* equipment, will be available also to advise on packaging problems.

The firm have also opened a London office at 124, Victoria Street, S.W.1, to deal with enquiries and assist customers in London and the south-eastern area.

Change of name

Lever's Cattle Foods, Ltd., has changed its name to Lever's Feeds, Ltd. Explaining the change, the chairman, Mr. R. H. Payton, said, "We decided to alter the company's name because with our increasing sales successes in all sectors of the animal feedingstuffs market we have decided that the old title of the company is no longer appropriate."

The firm has also decided to change the names of some of their products. The *Lobol* range of butterfat cake and calf meal and the *Ewbol* range of sheep feeds will be maintained but the names of the pig and poultry feeds will be changed from *Barlick* and *Viton* to *Lever's* pig and poultry feeds.

Correspondence

Deep frozen pineapple

SIR,

My attention has been drawn to your editorial article on page 98 of your issue of March 1, 1959, in which you refer to deep frozen pineapple. I note that you said that "There is still no deep frozen pineapple in European shops."

I must point out that this company has been distributing deep frozen pineapple in the forms of whole rings, half rings and chunks, under the *Table Top* label, for some years. This product is processed by our associate company, Deepfreezing and Preserving Pty., Ltd., in South Africa, and has enjoyed a favourable reception from the trade and the general public.

We wholeheartedly agree with your comments regarding its superiority to the imported whole fruit and to the top grade canned product, and we are confident that sales will increase rapidly as it becomes better known. Quick frozen pineapple can be harvested in its optimum condition and all its distinctive flavour and colour is retained by the rapid preservation method.

We are fully confident of the potential for quick frozen pineapple on the United Kingdom market, and shall be grateful if you will ensure that your next issue informs the trade of its availability.

Yours faithfully,
D. J. ASHTON-JONES,
Assistant General Manager.
Fropax, Ltd., London, E.C.1.

Through the courtesy of Fropax, Ltd., we have sampled "Table Top" quick frozen pineapple rings and other frozen foods marketed by this company. When thawed out, the fresh appearance and flavour of the pineapple rings is quite marked. We confess we were unaware of the existence of this product, and obviously it should have much more publicity.—Editor.

NEWS FOR IMPORTERS

Anglo-Japanese trade arrangements.—The trade arrangements between the United Kingdom of Great Britain and Northern Ireland, and Japan concluded in April, 1958, and covering the year ended March 31, 1959, have been extended to March 31, 1960.

Frozen beef tongues from North America.—The Board of Trade have announced a quota for the import of beef tongues during the 12 months ending March 31, 1960. Previous quotas for these imports have been allocated to importers of beef tongues from North America under arrangements first announced in Notice to Importers No. 709 dated January 18, 1955. Because the quota has since been increased, licences will now be issued also to importers of beef tongues from other sources. Accordingly, licences under the current quota will be issued on the basis of (i) imports of beef tongues from North America, and (ii) imports of beef tongues from other sources, during the year ended September 30, 1958.

Full details are contained in Notice to Importers No. 898, issued by the Import Licensing Branch of the Board of Trade.

Telephone numbers

The telephone number of Alfa-Laval Co., Ltd., has been changed to Isleworth 1221.

The telephone number of Gale and Mount, Ltd., has been changed to Isleworth 4334/5.

Change of address

The Technical Advertising Service, founded in 1922 as probably the first agency specially organised to serve technical advertisers, has moved to 83/89 Kingsway, London, W.C.2. The telephone number is not changed.

Telex numbers

J. H. Fenner and Co., Ltd., have been connected to the International Telex Service. Three branches, at London, Birmingham and Manchester have also been equipped with this service. The numbers are: Hull, 52247; London, 22405; Birmingham, 33281 and; Manchester, 66169.

Machinery agents

Buss, A.G., of Switzerland, manufacturers of the *Ko-Kneader* mixing machine, have appointed Hamilton Machinery Sales, Ltd., of 32, Buckingham Palace Road, London, S.W.1, as their agents for Great Britain and Ireland. Arrangements for the sale of Ko-Kneader equipment will be in the hands of Mr. Christopher Hamilton.

Sausage Preparation Room

The new sausage and meat preparation rooms of Marsh and Baxter, Ltd., at their Brierley Hill Factory are believed to be the most up-to-date of their kind in Europe. The most modern equipment has been installed; the rooms are completely fly-proofed with an air filtering and washing plant to eliminate airborne bacteria, maintain an even temperature and control humidity.

Sausage meat is conveyed to self-emptying bowl choppers and then to the filling machines. From the fillers the sausages are conveyed on stainless steel bands to special coolers and then to hygienic stainless steel tables for wrapping. All the equipment, with the exception of the bowl choppers, is British made. In addition, pie wrapping equipment has also been designed and installed by Rose's of Gainsborough which is capable of film wrapping 25,000 pies per shift.

Overseas Enquiries

Western Germany: Machinery

Herr Wilhelm Juenger of Friedberger Anlage 21, Frankfurt, is interested in receiving offers from British suppliers of bakery and confectionery machinery He is considered to be a suitable connection for U.K. firms.

Interested suppliers should write direct to the German enquirer with the fullest possible details, including delivery dates and other particulars, and, if possible, c.i.f. Hamburg prices in Deutsche Marks. At the same time, responding firms should notify the British Consulate-General, 47, Zeppelin Allee, Frankfurt, that they have done so.

Western Germany: Preserves and confectionery

Wesso Import and Handelsgesellschaft, Gelsenkirchen-Buer, Ringstrasse 38-40, would like to get in touch with United Kingdom manufacturers of fruit and vegetable preserves and confectionery with a view to acting as an importer for these products. They are considered to be a suitable connection for U.K. firms.

Interested manufacturers should write direct to the German concern. At the same time, they should notify the British Consulate-General, Cecilienallee 16, Dusseldorf, that they have done so.

Bottling plant order

Dawson Bros., Ltd., have received an order worth over £46,000 from the Dairy Marketing Board of Southern Rhodesia for a complete bottling plant for a new dairy to be built in Salisbury.

The contract includes two Dawson *Centurion* fully automatic hydro bottle washing machines, each capable of handling up to 16,800 bottles per hr.

The firm have also received an order from the Polish Government for eight machines, together capable of washing, de-labelling and sterilising 32,000 jars an hr. The order is worth almost £20,000.

The Polish Government have previously purchased four machines of this type.

Meat staining and sterilising

The Meat (Staining and Sterilising) Regulations, 1959, which were due to come into force on April 1, have been officially revoked. It has been decided that the requirements about the staining and sterilisation of unfit meat need further consideration.

COMPANY PROFITS AND PROSPECTS

Findus increase British capital

The directors of Findus, Ltd., have announced that the authorised share capital of the company has been increased to £100,000.

This increase is said to be part of plans now under consideration for the processing in Great Britain of certain products of the Marabou Findus Group. It has been emphasised that these plans in no way affect the appointment of Manuels Frosted Foods, Ltd., as the sole importers and national distributors of Findus frozen products for the United Kingdom.

Diversey group expansion

Following the acquisition of the Milton Group of companies by Vick Chemical Co. of America, through its English subsidiary, Vick International, Ltd., Deosan, Ltd., one of the Milton Group of companies, has been acquired by Diversey (U.K.), Ltd., a subsidiary of the Diversey Corporation of Chicago. The company produces sterilisers, detergents and fine chemicals.

Diversey products will also be made at the factory at Riddings in Derbyshire, where the Deosan products are produced. Diversey (U.K.), Ltd., will be the manufacturing unit, while Deosan, Ltd., will continue as the selling organisation.

Unilever profits rise to £91 million

The annual report for Unilever Ltd., and Unilever, N.V., shows that the consolidated net profit for the year ended December 31, 1958, rose from £40,270,000 for the previous year to £47,289,000, while the turnover increased to £1,728 million (£1,720 million).

Projects involving the expenditure of £44 million were approved in 1958. Among the projects for the food side of the group is plant for the manufacture and storage of ice cream and water ices, regional depots, and customers' refrigerators in the U.K., costing altogether £2¼ million, and extending processing and storage facilities for frozen foods in England (£1,475,000). The proposed expenditure on the foods products side amounts to over £8 million.

With regard to margarine and edible oils, the proposed expenditure amounts to more than £2¼ million, earmarked for use at Bromborough, England, in the further reconstruction and extension of the margarine plant and for various projects in Sweden, Turkey, and U.S.A.

The sales of foods continued at the high rate of growth shown in recent years and, while the trading margins remained the same as in the previous year, the larger volume of sales boosted profits. The total sales of food products (excluding margarine and other edible fats) amounted to £189,823,000 (£169,218,000). In the U.K., Birds Eye frozen foods continued to make progress: the tonnages sold of peas and fish increased considerably and the newer poultry products had a good year. The acquisition of Vita, N.V., a Netherlands frozen food processing firm, was also reported to have shown promising results. The sales of Lipton's tea in the U.S.A., both in volume and trading profit were described as satisfactory. Profits were lower despite the fact that the sales of soup mixes had shown a further rise in the U.K., Belgium and Canada and been maintained in the U.S.A.

Sales of Wall's ice cream and fruit ices in the U.K. showed an increase despite the poor summer but the profit was lower. Ice cream sales and profits in Germany increased and a second ice cream factory is to be built there. At home Batchelors' increased their sales of canned goods but profits were unsatisfactory. Mac Fisheries increased their turnover. The sales of Walls sausages, pies and other meat products increased, and those of Hartog's meat and meat products were maintained in the Netherlands.

The larger supplies of cheaper butter affected the consumption of margarine and sales were below the 1957 level. Cooking fat sales were higher. The sales of edible fats for the year amounted to 1,605,000 tons (1,617,000 tons).

In the U.K., sales of Summer County butter mixture and Blue Band margarine were the most affected, but Stork and Echo showed only a slight fall. Sales of compound cooking fats were also lower.

In the Netherlands, sales of Blue Band and other margarines increased and larger tonnages were also sold in Belgium, France and Switzerland. Margarine sales were lower in Germany, while in Austria the sales of the premium margarine showed an increase. Sales were increased in U.S.A., Canada, India, South Africa and most of the overseas countries.

Glaxo trading profits down

The provisional interim report for Glaxo Laboratories, Ltd., for the half year ended December 31, 1958, including for the first time those of Allen and Hanburys, Ltd., show a trading profit of £2,418,000. For comparison, Glaxo and Allen and Hanbury at last year's interim report, adding the figures together, showed a trading profit of £2,782,000.

The group turnover was 3% less than the corresponding period of the previous year and 6% less than the 6 months ended June 30, 1958.

Beecham offer for Pascall

The board of James Pascall, Ltd., have received an offer from Beecham Group, Ltd., to acquire the entire share capital of the company for cash, namely, 10s. per share for the 1s. ordinary, 15s. per share for the 18s. preferred ordinary, and 18s. per share for the £1 5% preference shares. The board have recommended acceptance of the offer.

Technical Press Review

May

Dairy Engineering.—A Million Pints of Milk a Week; Selling Milk to Two Nations; Preview of the Corrosion Exhibition; The Use of Vinyl-Based Paints in Dairies; Linings for Milk Tankers; Recent Dairy Developments in Eastern Europe; Bulk Handling in Scotland.

World Crops.—Land Clearance and Utilisation: Land Reclamation and the Old and New Punjabs; Contour Bunding in India; The Cultivation of Citrus—1; Sugar Cane in New South Wales.

Manufacturing Chemist.—Expansion in the Pharmaceutical Industry; Wellcome's New Vaccine Laboratories at Beckenham; Interferon—A New Approach to Chemotherapy; 2-Vinyl Pyridine—A Versatile Intermediate; Report on the Cosmetic Congress; Disinfectants and Disinfection.

Chemical and Process Engineering.—Fractional Distillation; Electronic Process Control; Pneumatic Control Techniques and their Effects on Stability; Nucleonic Instruments in Process Control; Uranium Factory at Springfields.

Petroleum.—Well Acidising History and Developments; Cat. Reforming with RD-150 Platinum Catalyst; Heat Transfer to Liquids in Intermittent Flow.

Paint Manufacture.—Silicone Resins in Silicone Coatings; Selection of Suitable Solvents for Nitrocellulose Lacquers; Typewriter Inks and Ribbons; Annual Conference of the Association of Printing Technologists.

Automation Progress.—Data Logging in Chemical Plant; Numerical Control for Marking Out and Jig Boring; Transient Response in Electromagnetic Clutches—2; Spool Valve Stability; Superconducting Computing Devices.

For specimen copies write to Leonard Hill House, Eden Street, London, N.W.1.

Food News Overseas

New U.S. food additive law enforces pre-testing

On March 5 the Food Additive Amendment became law in the U.S.A. Officially designated the Food Additives Amendment of 1958, it amends the Federal Food, Drug and Cosmetic Act of 1938, and makes the pre-testing of food additives a legal requirement. Hitherto, responsibility for testing had been entirely voluntary on the part of manufacturer or user. To comply with the law, those seeking approval for an additive must now conduct extensive laboratory experiments, including toxicity tests on animals, to prove that the additive is safe relative to the proposed method and quantity of intended use. According to the Federal Food and Drug Administration, the law affects only those substances that are not ". . . generally recognised by qualified experts as safe for their intended use."

The regulations will not prescribe the types of testing necessary. Petitions for approval must include a history of the substance, its source, composition and stability data, proposed method and quantity of use, control procedures, and detailed descriptions of the biological experiments conducted to determine its safety. The regulations include a provision for accepting drugs in certain instances as food additives. Pesticides and coal-tar colours are not included in the provisions of the amendment because they are already subject to other sections of the Act. Also exempt are other substances previously given informal sanction under the Food, Drug and Cosmetic and the Department of Agriculture's Meat Inspection Act or Poultry Products Inspection Act. The Food and Drug Administration has compiled a list of 188 food additives believed to be exempt from testing requirements because they are generally regarded as safe, and additions to the list are contemplated.

The already exempted additives include 61 preservatives, 39 buffers and neutralisers, 35 nutrients, 5 non-nutrient sweeteners, 5 colouring agents, 5 stabilisers, 4 emulsifiers and 34 other additives.

A noticeable aspect of the hearings leading to this enactment was the absence of concerted commercial opposition. Representatives of the food and chemical industries provided voluminous testimony at the request of the legislators. According to the F.D.A., during the past 20 years there have been no deaths attributable to toxic additives, and only a few cases of poisoning, of a non-permanent nature, ascribed to the use of two food colours which have now been withdrawn. The F.D.A. says that the reason for this clean record is that the responsible members of the food and chemical industries have conducted their own careful testing programmes for many years and have conferred extensively with that agency about most new additives.

Automatic tomato pulp machine

What is claimed to be the first fully automatic tomato-pulp making equipment, consisting of a series of 15 units, has been built in Hungary, according to a design by Vilmos Keilwert, Kossuth Prize-winning Hungarian chief designer.

The new equipment has been installed and operated at the Szeged Canning Plant, where they process 16 railway waggon-loads of tomatoes daily.

The processing time has been reduced from 5-6 hr. to 1¼ hr. Canning takes place at a temperature of 50°C. to 70°C. so that the tomato purée retains its original colour, flavour, and vitamin content, the makers claim.

Ten more automatic plants are to be built this year in Hungary for export, because the pulp-maker is said to have aroused great interest all over the world. The designers are now busy trying to improve further the exploitation of the new equipment, since, tomato-pulp making being a seasonal industry, the automatic equipment would remain idle through the greater part of the year.

Pine-canning in South Africa

Some uncertainty exists among pine-growers in the East London area of South Africa as a result of the fact that prices for canned pines have declined on the United Kingdom market in order to meet competition from Australia. A deputation drawn from pine-growers throughout the country and from two leading canneries have interviewed the Minister of Agriculture about the future welfare of the industry, with particular reference to the introduction of a minimum price scheme for pine growers.

Jamaican sugar factory extensions

Work has commenced on extensions, estimated to cost nearly £1 million, on the factory at the Frome Estate in Jamaica of the West Indies Sugar Co., Ltd. These extensions, which are expected to be completed in time for the 1960 crop, will enable processing to take place over a shorter period, with consequential benefits in yield.

Food plants for Rhodesia

A £250,000 pork products factory is to be built in Salisbury by Colcom Products Central Co-operative, Ltd., although the actual site has not yet been decided upon, reports Barclays Bank D.C.O. The factory will produce bacon, sausages and other pork products; it is unlikely to be completed before the middle of 1961.

Negotiations have been concluded for the establishment of a milk processing plant in Salisbury by Nestlés, the Bank also reports. Building will probably start within six months, and the first stage of development will cost between £250,000 and £300,000. Initially only powdered whole milk will be manufactured, and the initial milk intake is expected to total 1¼ million gal. a year, eventually increasing to 2 million gal. yearly. Production should begin in 1960.

Food preservation by irradiation

An enterprise started by M. Pierre Vidal, chemist, physicist and a pupil of the late Prof. Joliot Curie, has produced such startling results that a group of French firms, representing some of the biggest French industrial interests, has joined together in launching a joint research development centre for the commercial application of nuclear energy in food preservation.

The food is subjected to gamma radiation from a cobalt source for varying lengths of time. The food is usually placed in a basket for lowering into a tub-like receptacle containing the cobalt, or it may be passed between uprights on an assembly line which contain the cobalt.

M. Bigourdan, M. Vidal's chief assistant, claims that they have kept meat fresh for more than a year. Other foods for which success is claimed include vegetables, pork butcher's meat, chocolate, cooking oil and fruit. After complete sterilisation has been obtained, it is believed to be only necessary to wrap the food and it keeps for a long period.

Packaging

Polythene bags

High clarity polythene is now being made by Henry Jackson (Liverpool), Ltd. The firm state that one of the reasons why the changeover to polythene in the U.S.A. has been faster than in this country was the availability of polythene with high gloss and clarity characteristics.

The new product, known as *Jackson Polythene*, is claimed to have a high gloss and good see-through properties.

Cheese spreads

Kraft Foods, Ltd., are giving a new look to their range of cheese spreads, which are now to be marketed under the collective heading of *Cheese Snacks*. They will comprise the following *Kraft* varieties: Cheese n' Onion; Cheese n' Tomato; Cheese n' Celery; Welsh Rarebit; Cheese n' Bacon; and Stardale.

The labels and specially designed "sell outs" have been revised to give an overall "family" design; it is felt that the new method of selling these cheeses will enable the housewife to have a varied selection of spreads more economically.

Collapsible metal tubes

Upon comparing notes with a Swedish tube-maker, Universal Metal Products, Ltd., found that while toothpaste creates the greatest demand for tubes in this country, the demand for tubes for toothpaste in Sweden, as opposed to the demand for tubes for food products, is quite small.

To meet the growing demand for metal tubes which they anticipate will arise in this country, Universal Metal Products say that they have a laboratory which is at the service of the customer. All the customer has to do is send a quantity of the product to be packed and the laboratory will test and advise on the type of tube and the internal protection needed, if the product calls for it.

Polyethylene-coated corrugated board

A new type of corrugated board, incorporating a moisture and grease-proof polyethylene coating, has been developed by Mead Board Sales and Mead Containers, Inc., Cincinnati, Ohio, subsidiaries of the Mead Corporation. Coated with U.S. Industrial Chemical Co.'s *Petrothene* resin, the new board is thought to be an important stride in the packaging and shipping fields and is expected to find wide acceptance for packing meat, confectionery goods, dairy products, and other commidites requiring a high degree of protection.

Collapsible tubes for food made by Universal Metal Products Ltd.

Mead Containers, Inc., recently commenced commercial production of a line of high quality corrugated containers incorporating this material.

The unusual moisture resistant properties of polyethylene are said to make polythene-coated corrugated shipping containers ideally suited for fresh meats in particular. Reports of trials to date have shown that weight-loss of meat through vapour transmission is significantly reduced when polyethylene coated board is used to about 1 lb. per 50 lb. carton.

Polyethylene coated corrugated containers also offer advantages for a number of other food products. Its grease resistance makes it a "natural" for butter, baked goods and other greasy foodstuffs, while its moisture barrier guards against damage from water or other liquids.

The corrugated containers are produced by a process developed by the firm. The resin is applied to Kraft board and then run on a corrugator. For most applications the coating is desired on the inside of the eventual container and in such cases the polyethylene coated Kraft is applied to the single face side.

The polyethylene coated board can also be run successfully on the opposite side (double backer) of the combined board.

Kraft Foods, Ltd., are now producing their six varieties of processed cheese in these packs known as cheese snacks.

Aluminium foil displayed

The Empire Aluminium Co., Ltd., one of the Venesta group of companies, recently exhibited their range of products at the Scottish Dairy Show at the Kelvin Hall.

Among the examples of their range of products were specimens of rotogravure printing on milk capping strip. It is stated that this method of printing is used whenever high-quality reproduction is required. Other exhibits included perforated synchro-printed capping strip.

Venesta themselves were showing ice cream and cheese foils.

Aerosol pack

Solvolene Lubricants, Ltd., are now marketing a silicone aerosol pack under the name of *Solvosol*. Packed in a 16 oz. aerosol container, the firm claim that the product is being marketed at a price somewhat below the present accepted price level.

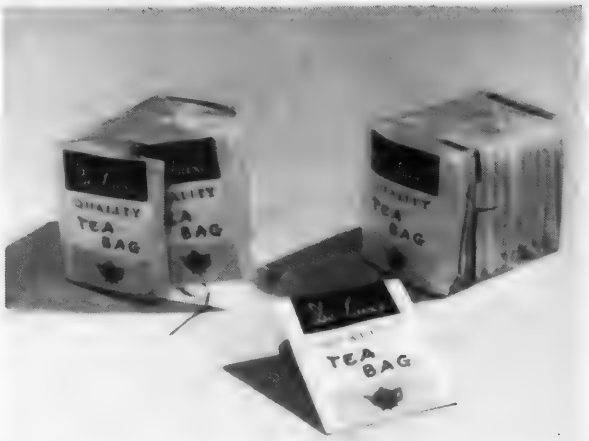
Use is made of a larger container than usual and the valve is new, allowing more silicone to be used with less propellant.

The makers say that the silicone spray has applications as a non-stick agent for toffee moulds and so on in the confectionery trade, in ovens, etc., in the baking industry, and on wrapping machines and other machines used in the food industry.

"Cartonless" strapping

A special type of "flatted wire" for use in cartonless strapping has been developed by the Package Sealing Co., Ltd., who say that this invention opens up the way for greater applications in the strapping industry.

The section of this new wire is said to conform smoothly to the contours of the shapes of the objects being strapped and is able to bind them securely without damage. Economical use is claimed for this wire, which the makers say has a greater strength than the equivalent round wire or banding. The wire is marketed in a galvanised finish, giving considerable rust-proof qualities.



(Left): **Round and oblong Neataseal tins made by the Metal Box Co., Ltd.** *(Right):* **Cellophane bags with E. S. and A. Robinson's Kwik-Rip device.**

New adhesive tape

A new strong, tough, rayon-reinforced strapping tape, known as *Transostrap,* has been added to the Gosheron range of self-adhesive tapes. The new tape has a tensile strength of 120 lb. per in., and an adhesion value of 31 oz. per in. width. It bonds itself to a carton, forming an integral part of the container so that impact stresses will not act directly on the strapping itself to cause damage to the goods inside the case.

The reinforcement cannot work loose, and is obtained without danger of the tape cutting into the carton and damaging the contents. It is claimed that this permits the use of lighter and cheaper cartons than would otherwise be necessary.

The tape requires no special applicator, and should be applied firmly and allowed to bond for two or three hr., as it has a soft adhesive and does not give an immediate grip to the board. It hardens after a short time and the makers say that the grip then becomes extremely tenacious.

Transostrap is available in 50-yd. rolls in widths of ⅜, ½, ¾ and 1½ in. The basic material is a vinyl film reinforced with parallel rayon threads.

Tear-strip bags

A new tear-strip device which can be incorporated in transparent *Cellophane* bags to enable them to be opened quickly down the face, gussets, or seam has been introduced by Robinsons of Bristol. Known as *Kwik-Rip,* Robinsons say that it allows the bags to be opened either completely or only in part so that the bag can be used as a dispenser.

The device consists of a red strip or black hairline incorporated in the bag during manufacture. An advantage claimed for locating the strip in the seam of the bag is that the film overlaps at this point, so that the hole left by the punched-out "starter" tab is backed by the underlying film, giving a leakproof and hygienic pack. The starter tab can be positioned anywhere along the tear line, and can be designed to tear in either direction—instructions for the user being printed accordingly.

The device may be used where outer bags for sachets are concerned, and will also be suitable in one-use packs such as for confectionery, meat pies, and other foods. Other applications include dispenser packs for tea or coffee bags.

Biscuit tin

Farley's Rusks are now being packed for export in the new *Neataseal Tin* recently developed by the Metal Box Co., Ltd. These tins, while primarily intended for biscuits, cakes, and confectionery, are believed to be equally suitable for most other dry goods. They can be made either round or oblong.

It is a slip-lid container with a special diaphragm consisting of a thin aluminium foil coated with a non-toxic thermo-plastic adhesive, sealed over the inward curve of the top edge of the body.

After the tin is filled, the diaphragm is sealed on by applying heat and pressure. Both the temperature and the time taken for sealing are controlled by the closing machine. The diaphragm may be plain, lacquered, or random printed in any number of colours, on the outside.

The body has a lined end, and may have either a plain or externally soldered side seam.

The slip lid has an external curl, and a slightly recessed panel in the top which rests against the diaphragm, thus giving it support against pressure from the contents when in transit.

New Companies

Airedale Confectionery, Ltd. (620903.) £100. Subs.: Donald Best, 15, Gladstone Road, Rawdon, Leeds, and Derek Chambers.

Barry Dispensers, Ltd. (622752.) Hillary Rise, Cadoxton, Barry, Glam. To carry on the bus. of mnfrs. and distributors of non-alcoholic soft drinks, aerated, mineral, table and artificial waters, confectionery, etc. £1,000. Dirs.: Henry B. Gibby and John H. Gibby.

Choc-Elite, Ltd. (622609.) 33-5, Church Street, Radcliffe. Mnfrs. of and dlrs. in confectionery, chocolate, etc. £5,000. Dirs.: A. N. P. Addison and Dr. Robert E. Gibson.

Mister Softee International, Ltd. (618588.) Office of E.V.S. (Birmingham), Ltd., Richard Street, Birmingham, 7. Mnfrs. of and dlrs. in and distributors of mobile ice cream vehicles, and of fresh dairy ice cream mixtures and associated products, etc. £10,000. Dirs.: Frank Williamson and R. B. Green.

Mister Softee (United Kingdom), Ltd. (618589.) Office of E.V.S. (Birmingham), Ltd., Richard Street, Birmingham, 7. Distributors, buyers, sellers, importers and exporters of and dlrs. in ice cream mix, ice cream products, etc. £100. Dirs.: Frank Williamson and J. A. Caldecott.

Podolia Co., Ltd. (618393.) 159, Waterloo Street, Oldham. Mnfrs. of and dlrs. in foodstuffs, drinks, confectioneries, etc. £5,000. Subs.: Michael J. Bornham and Joan O. Stanley.

Strand Beverages, Ltd. (618358.) Mineral and aerated water mnfrs., etc. £100. Subs.: Edward A. Southin, 79a, Bramley Road, London, N.14, and F. V. Smith.

Van Houten Sales, Ltd. (618484.) Mnfrs. of and dlrs. in cocoa, chocolate and confectionery, etc. £100. Subs.: Anne C. Tunnell and Patrick J. Frost, 29, Martin Lane, London, E.C.4.

These particulars of new companies recently registered have been extracted from the daily register of Jordan and Sons, Ltd., Company Registration Agents, 116, Chancery Lane, London, W.C.2.

Recent Patents

COMPLETE SPECIFICATIONS ACCEPTED

810,531. T. Hedley and Co., Ltd.: Packaged foodstuffs.
810,717. Brown, Boveri and Cie A-G.: Device for preparing ice cream in refrigerators.
810,537. Upjohn Co.: Sweetening composition.
811,018. H. Jansen: Sausage meat cutter knives.
810,944. Proctor Electric Co.: Latching mechanism for the bread carriage of an electric toaster.
810,762. Unilever, Ltd.: Food products.
811,055. Westinghouse Electric International Co.: Cooking apparatus.
810,215. B. Jacobsson: Method for the production of pasteurised beverages, and apparatus for carrying out this method.

ABSTRACTS OF BRITISH PATENTS

Dough moulding machines

The invention relates to dough moulding machines, the operation of which is the counterpart of manual kneading. In such machines, pre-treated pieces of dough of equal weight are flattened between pinning rollers, rolled up spirally by one or more serrated rollers, passed between a rotating drum and a stationary deck, and delivered in cylindrical form. The normal output is stated to be of 2 lb. dough pieces, usually at the rate of about 30 per min. It is claimed that increasing the speed of operation to produce 1 lb. loaves at 60 per min. results in decreased efficiency. The object of the invention is to provide a machine capable of treating pieces of dough up to 1 lb. in weight at the rate of 100 per minute.

The essential feature is the division of each pinning roller transversely into two halves, and the further division of the moulding deck into two sections, each of which is engaged between a pair of adjustable guide flanges. The two sections of the pinning assembly are fed with dough pieces by conveyors, and the two streams of the dough pieces are kept separate throughout their passage through the machine. Two sheets of drawings are appended to the specification.—805,202. *Thomas Barker and Sons, Ltd., and G. N. Masters.*

Preventing "stalk rot" in fruit

"Stalk rot," which attacks some fruits, and is a serious problem in the transport and storage of bananas, is caused by the fungus *Thielaviopsis paradoxa*, which enters the cut surfaces, after bananas have been cut, and thereafter infects the stems and fruit. Various methods of combating the disease, none of which is quite satisfactory, are reviewed, the best hitherto being the application to the cuts of a rapidly drying "paint" containing fungicides.

It has been found that the growth of the fungus can be arrested by suitable substances having a sufficiently high vapour pressure to act in the vapour or gaseous phase. The substance used is absorbed on porous material covered by a cap-like enclosure impervious to gas. The latter is affixed to the banana stalk ends by a rubber band. Filter paper is a suitable porous material, the inhibitor being applied in solution, and the solvent allowed to evaporate. The enclosure may be of metal foil, regenerated cellulose, polyvinyl chloride, rubber hydrochloride, cellulose acetate, rubber, or paper coated with asphalt or paraffin wax.

The preferred inhibitor is 8-hydroxyquinoline. Other effective inhibitors are tetrahydrophthalimide and N-trichloromethylmercaptocyclohexane-1·2-di-carboximide ("Capten"), also sulphur, iodine, and diphenyl. The quantity of inhibitor required is from 0·2 to 0·5 g. for each enclosure.

In an example, banana bunches treated as described with 8-hydroxyquinoline were practically free from stalk rot, whereas untreated bunches were affected to the extent of 90% after three weeks.—806,762. *Rederiaktiebolaget Nordstjernan (Sweden).*

Simulated meat product

This patent, which is additional to 746,858, relates to a food product which simulates the texture of cooked meats. The product, cohesive and non-uniform in appearance, consists of a "chewy protein gel," formed by heat from a gel precursor, and an outer additive of dough. The latter is made of flour, preferably wheat flour, and water. The gel precursors are preferably oilseed proteins, from groundnuts or soya beans. Methods are described for removing the gelling inhibitor naturally present in most soya bean meals. The protein concentration in the gel precursor is preferably not higher than 35%, and may even be as low as 14%. The *p*H is preferably from 6·0 to 7·5. Edible fats up to 20% in amount may be added.

Other additives may be proteins, such as gelatin or casein, flavouring, colouring agents, or emulsifiers. The desired texture is obtained by repeatedly folding and rolling sheets of the gel precursor, with additives, and the dough, the latter constituting from 3% to about 30% of the whole. The final product is either canned and cooked in an autoclave, or sliced, vacuum packed in polyethylene and cooked in an oven at 100°C. in an atmosphere saturated with water vapour.—806,116. *Unilever, Ltd.*

Notes for Contributors and Authors

The Editor of Food Manufacture welcomes articles, news items and other contributions on all aspects of food production.

The purpose of this journal is to exchange information between all those concerned in the food industry. Articles should therefore be written in a readable style, avoiding esoteric terminology and technical jargon, and should contain factual and practical information.

A preliminary synopsis should, preferably, be sent to the Editor, and the contribution itself should be typed in double spacing on one side of the paper only. It should bear the name and address of the author and should be accompanied by photographs suitable for illustrations.

Trade Marks

LOCH KYLA.—783,235. All goods included in Class 29. **William James Peddie** trading as **The Kylanko Trading Co.**, 26, Tarleton Street, Liverpool, 1.

NOUGAROON.—779,252. Non-medicated confectionery. **Sun D'Or, Ltd.**, Manor Royal, Crawley, Sussex.

COKOROLLS.—B779,525. Non-medicated liquorice confectionery coated with coconut. **W. R. Wilkinson and Co., Ltd.**, Ferrybridge Road, Monkhill, Pontefract, Yorks.

NOTINA.—781,439. Preparations in Class 29 made from nuts or from nuts and sugar, the nuts predominating, being goods for spreading on foodstuffs. **J. Klasi, Nuxo-Werk A.G.**, Kempraten, Rapperswil, Switzerland.

LEMCO.—715,535. All goods included in Class 29 for sale in the U.K. and for exports to the U.S.A. and to the respective colonies and dependencies as constituted on March 6, 1953, and to Eire, but not including meat extracts. **Oxo, Ltd.**, Thames House, Queen Street Place, London, E.C.4.

PAXO.—764,862. All goods included in Class 29 but not including stuffings for foods. **John Crampton and Co., Ltd.**, Altrincham Road, Wythenshawe, Manchester.

SUNDOWNER.—779,751. Non-alcoholic fruit milk beverages (the milk predominating). **Robin Dean,** Glen Usk, Caerleon, Mon.

ROSE COUNTY.—781,267. Canned meats. **Roy Stewart and Co., Ltd.**, Buckingham House, 19-21, Palace Street, Westminster, London, S.W.1.

LION.—B782,594. Eggs, egg products (for food), dried eggs, liquid eggs, frozen eggs, powdered eggs, egg yolks and egg whites (for food). **British Egg Marketing Board,** Mercury House, 109-119, Waterloo Road, London, S.E.1.

MR. EPICAM.—782,636. Hams, bacon, tongues (for food), bath chaps, sausages, edible lard and meat. **The Epicure Ham Co., Ltd.**, 2, Church Row, Pershore, Worcestershire.

THE SQUIRE.—783,714. All goods included in Class 29. **A. Mathews and Skailes, Ltd.**, 5, 7, and 9, London Bridge Street, London Bridge, London, S.E.1.

LEMCO.—715,536. All goods included in Class 30 for sale in the U.K. and for export to the U.S.A. and to the respective colonies and dependencies as constituted on March 6, 1953, and to Eire. **Oxo, Ltd.**, Thames House, Queen Street Place, London, E.C.4.

PAXO.—764,863. All goods included in Class 30, but not including cereal preparations for use as stuffings. **John Crampton and Co., Ltd.**, Altrincham Road, Wythenshawe, Manchester.

MR. EPICAM.—782,637. Meat pies. **The Epicure Ham Co., Ltd.**, 2, Church Row, Pershore, Worcestershire.

THE SQUIRE.—783,715. All goods included in Class 30. **A. Mathews and Skailes, Ltd.**, 5, 7, and 9, London Bridge Street, London Bridge, London, S.E.1.

New patents are from the Journal of Patents and new trade marks are from the Trade Marks Journal. In each case permission to publish has been given by the Controller of Her Majesty's Stationery Office. Each of the publications is obtainable from the Patents Office, 25, Southampton Buildings, London, W.C.2.

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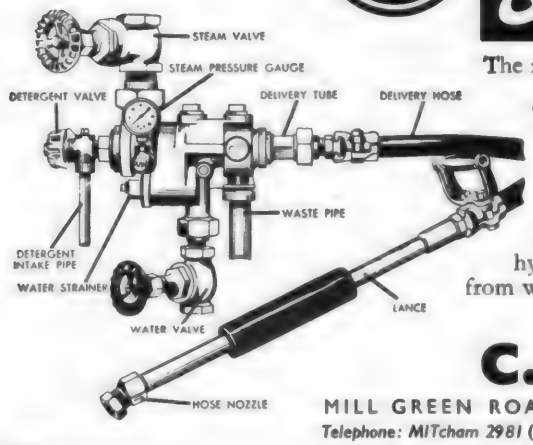

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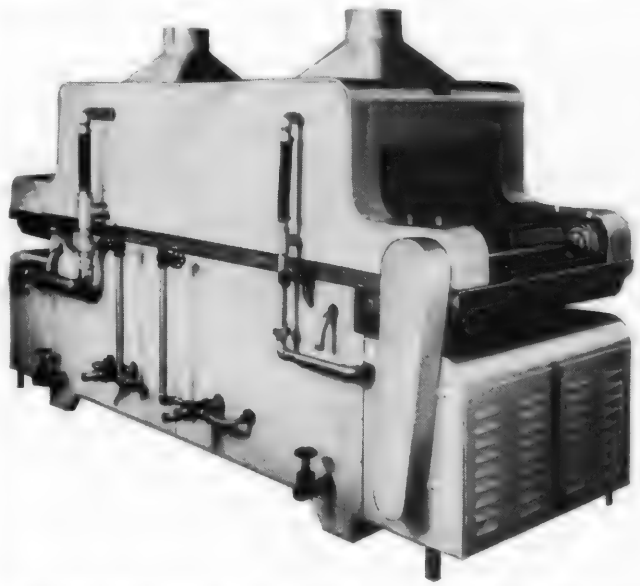

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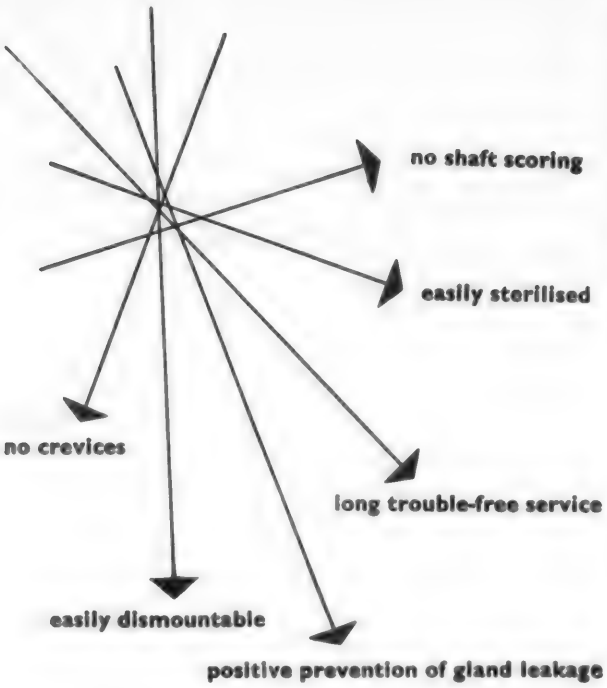

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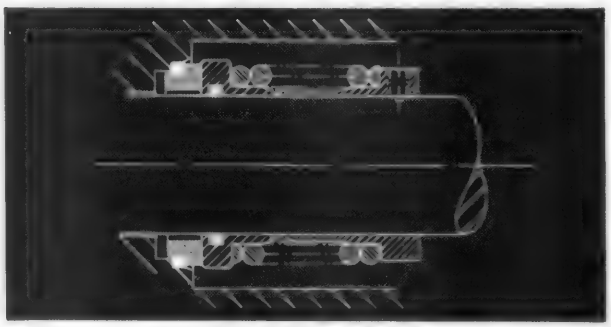

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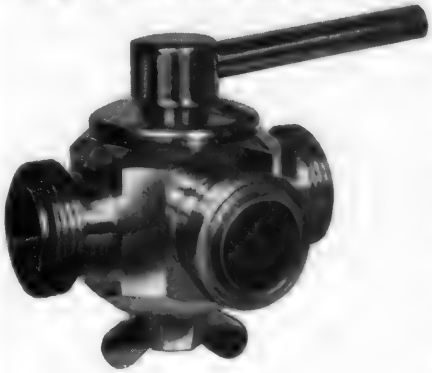

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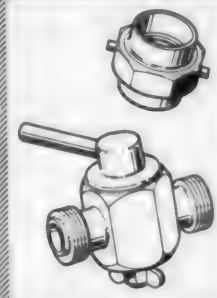

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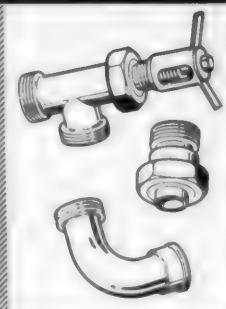

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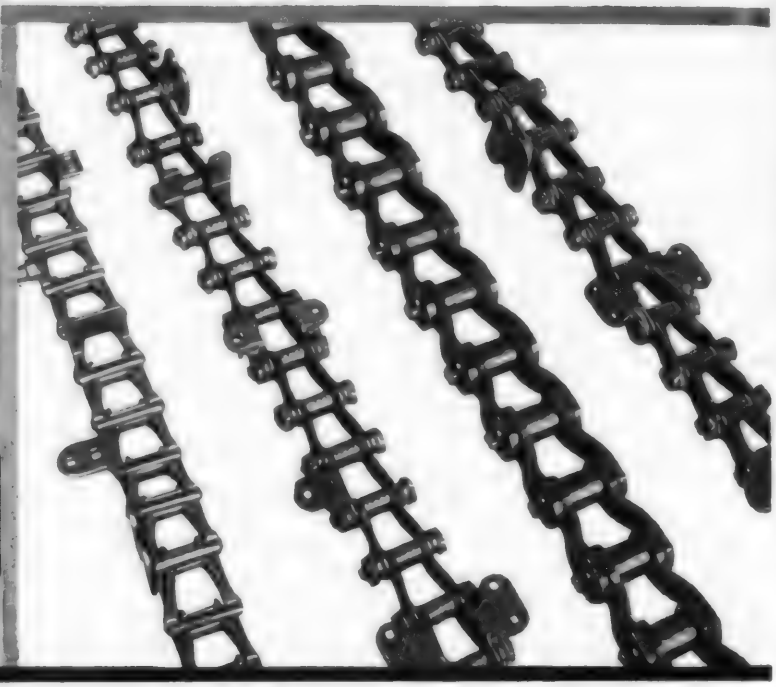

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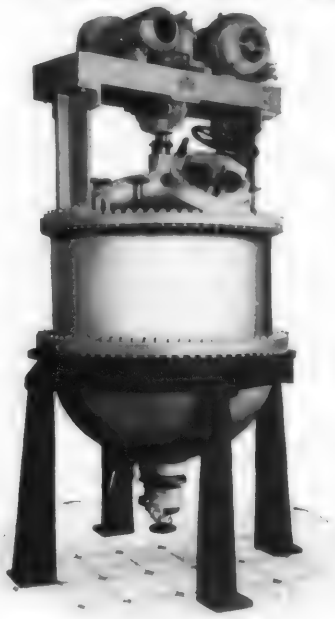

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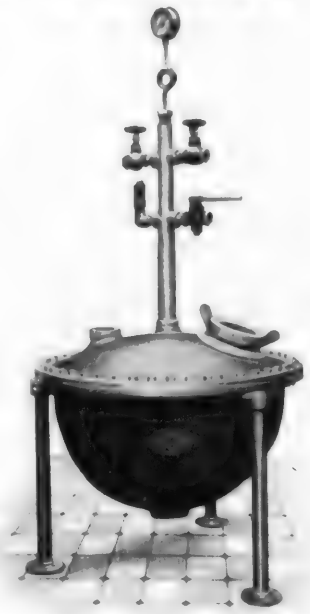

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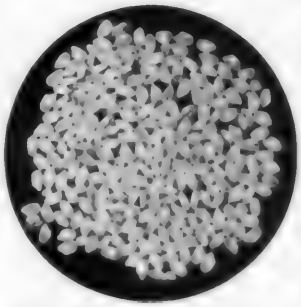

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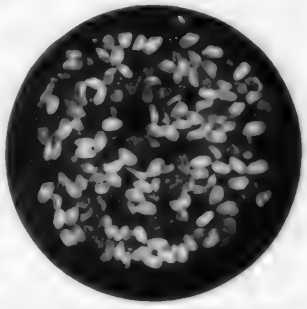

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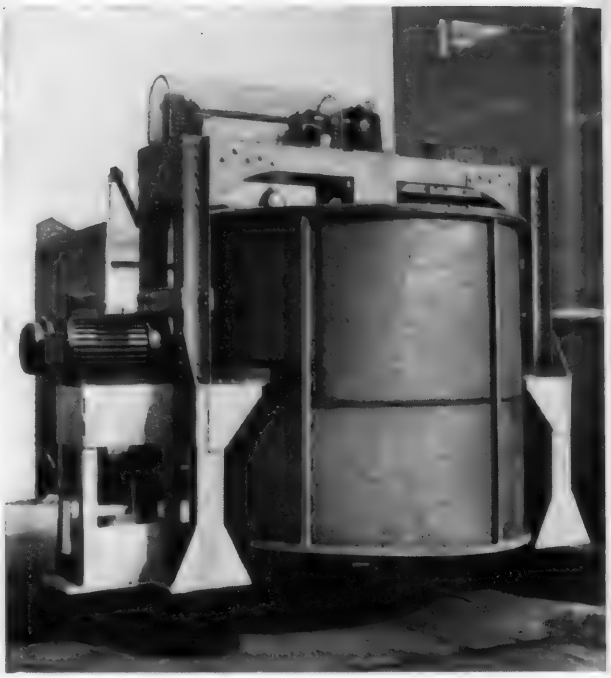

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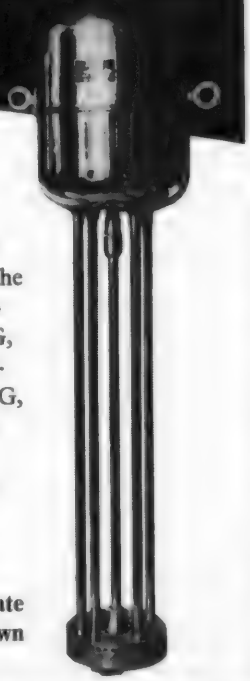

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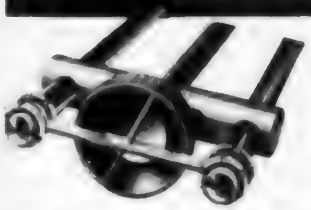

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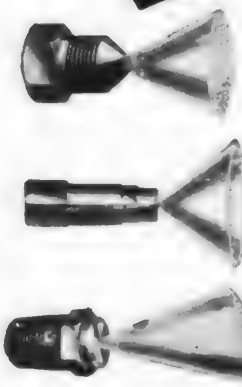

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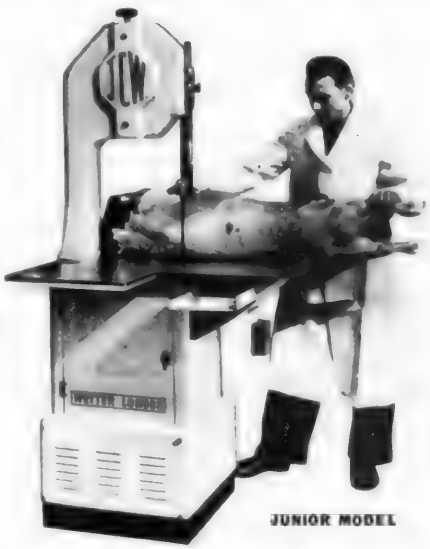

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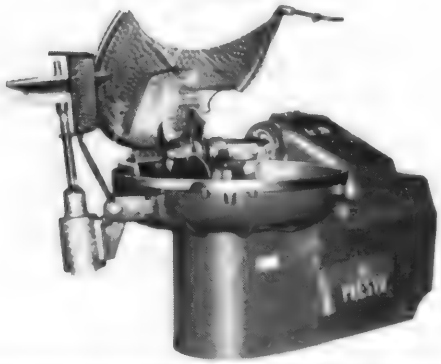

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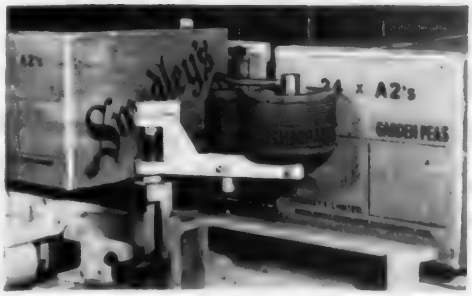

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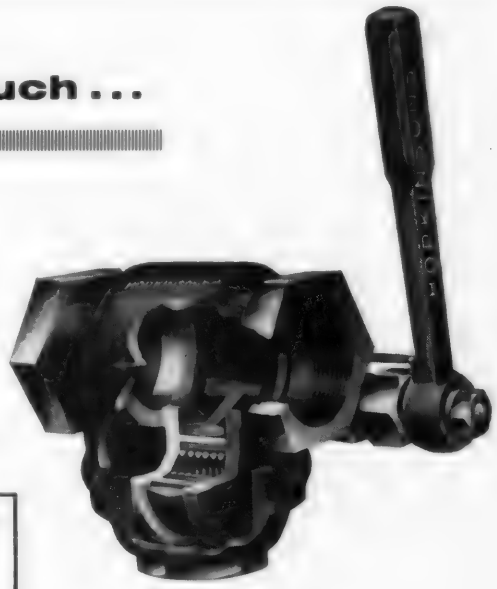

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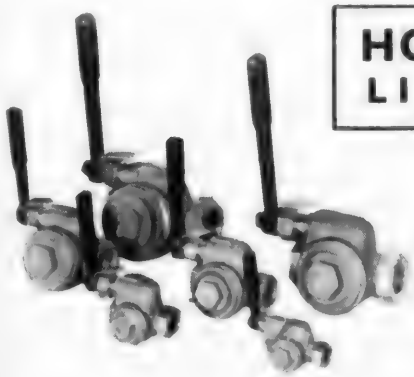

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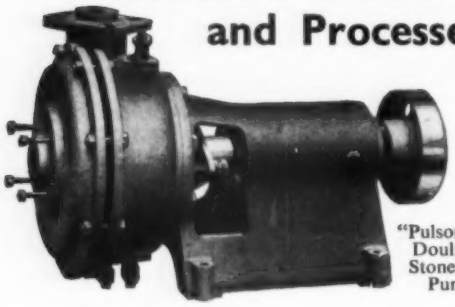

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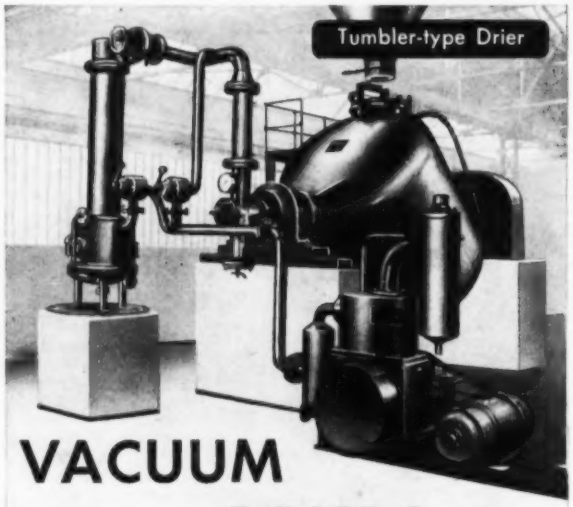

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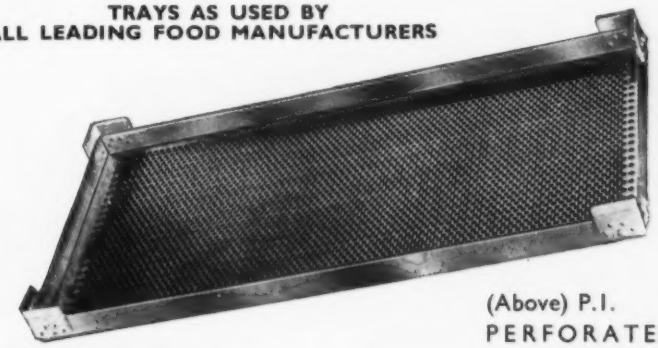

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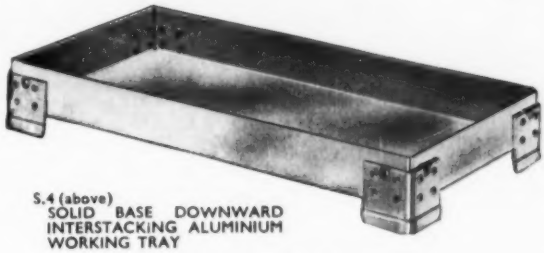

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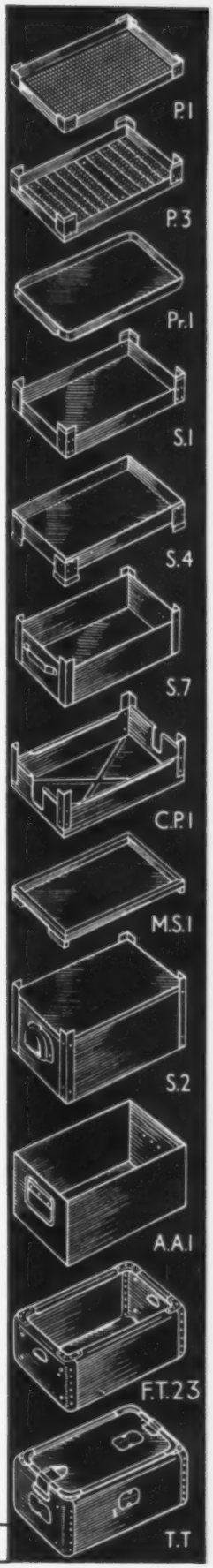

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